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Low Prices Attract Buying

Railroad and Vessel Business Pending

Heavy Pig Iron Purchases by Pipe Foundries— A Canadian Rail Inquiry

While the policy of keeping stocks at a minimum, by which consumers have been throwing all the chances of the market upon the mills, is unchanged, there are further evidences that the cheapness of steel is producing business. The railroads have been influenced by it to some extent, though it is evident, too, that purchases which they have long been classing as optional have at last become imperative.

Car orders have increased. The Missouri Pacific has bought 2400 and is expected to buy more. The New York Central has bought 1000 and is in the market for 2000. The Pennsylvania is preparing another inquiry and the Baltimore & Ohio is figuring on 5000 to 6000 cars, the need of which has for some time been apparent to its shippers. The New York Central's contract for 40 locomotives is a welcome break in the dullness in that line.

It appears, too, that the low level reached for plates and shapes has started some figuring on lake boats, in spite of the forbidding outlook for vessel owners. Capital is attracted by building enterprises, also, when fabricating companies are able to offer their product at \$38. Open hearth bars are sold low enough to compete with hard bars for concrete reinforcement, and the cuts in shafting have been deep enough to induce some forward contract business.

A reduction of 84,000 tons in September in the accumulated orders of the Steel Corporation indicates a moderate falling off from the rate of new bookings in August, when orders showed a gain of 111,000 tons. It is to be considered that the daily rate of shipments from the mills was greater in September than in August and that the corporation's blast furnaces are now turning out pig iron at about the same rate as in the past three weeks.

The week has brought lower prices on some finished products, but they yield less readily at the present levels.

The Canadian Pacific is inquiring for 50,000 tons of rails, deliveries to begin in the spring of 1912. The duty of \$7.84 is one obstacle to this business coming to the United States, though a Chicago district mill recently finished rolling an urgent order for 30,000 tons for this railroad. While Canadian rail mills will be crowded for some months, they will be able later to take on the business now pending and American makers are not at all sanguine of getting it. The Chesapeake & Ohio has placed a 4000-ton rail order at Gary and a Southern road has increased its original order to a western Pennsylvania mill.

Structural and plate mills are encouraged by the steel car business of the week and in the East shipyards are figuring on fully 20,000 tons. The great

Madison Square buildings in New York will require 22,000 tons. In Chicago the Field Museum steel contract, 10,000 tons, was taken by the Bethlehem Steel Company.

The Texas Company will buy 150 miles of 6-in. line pipe which is expected to go to the Republic Iron & Steel Company.

Quotations on semi-finished steel are no longer made at a uniform Pittsburgh and Youngstown price, but mills west of Pittsburgh are giving buyers farther West the freight advantage of their position. Thus open hearth billets have been sold from Ohio mill at less than the \$19 Pittsburgh basis.

Buying by pipe foundries has been the feature of the pig iron market. The largest company and an Eastern company have taken together about 50,000 tons of Northern and Southern irons. The foundry iron market has broadened but little. What business has been closed for 1912 has been substantially at the prices quoted for this year. Stocks in furnace yards were reduced in all districts in September, but buyers see also the increase in the output of merchant iron.

Bessemer and basic iron are weaker in the Central West, the former being now quoted at \$14.50 and the latter at \$12.50 at Valley furnace. A sale of 6000 tons of basic was made by a Chicago district furnace for delivery at St. Louis.

German iron and steel markets are stronger, a record business being reported in bars and plates, in both of which advances are likely. Galvanized products are also higher abroad in view of the sharp advance in spelter.

It is noteworthy that almost without exception this week's reports from the machinery markets show an improvement in inquiries and orders—confirming the tradition of October activity in that trade.

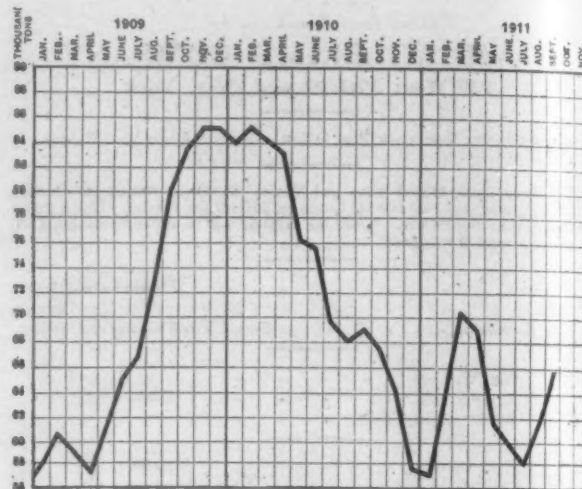
The Curve of Pig Iron Production

The fact that pig iron production is increasing when prices are at the low point for the year has caused some comment since the publication of our blast furnace statistics for September. It would seem that a net gain last month of seven in the number of merchant furnaces active is to be accounted for in part by individual conditions, as where a furnace company with a regular foundry trade has found its stocks of iron materially cut down and the call for iron continuing, while one or more furnaces were idle. But the reduction of furnace yard stocks has been general in the past month and there has been in nearly all districts enough urging forward of shipments, on the part of melters, to show that as a rule they are carrying comparatively little iron. The statistics and the known facts concerning the movement of merchant iron agree in indicating that after steadily declining for seven months, the production of merchant iron had fallen below the consumption.

So far as the steel works blast furnaces are concerned, their daily rate of production in September was the highest for more than a year and reflected the relatively large output of finished steel in that month.

The interesting question is whether the increase in steel works and merchant furnace output is to continue. A week ago a half dozen merchant furnaces were named which were to blow in in the early part of this month. This week nearly as many are known, that

have blown out since the month opened or will soon do so. The steel works furnaces, if the slight falling off in accumulated orders is a criterion, are not apt to increase their output greatly. However, the active furnaces at the opening of the month had a total capacity of 565 tons a day greater than the average production in September, so that some further increase is to be looked for. In this connection the accompanying diagram is instructive. It is taken from our monthly



Curve of Daily Rate of Pig Iron Production by Months, in 1909, 1910 and 1911.

blast furnace chart and shows graphically the course of pig iron production in the 33 months beginning with January, 1909. It represents strikingly how the ascent of the curve in the seven months after April, 1909, was followed by a descent in the 14 months after November, 1909. Then came a rise, followed by a corresponding decline. Another rise is now in progress, and the wavelike movement shown at the right of the diagram suggests that the upcurve produced by the August and September production will be carried somewhat farther.

The figures on which the diagram is based are given in the total or right-hand column in the table below. The first and second columns give respectively the steel works and merchant production. For 1909 and 1910 the daily averages are given by quarters, while for 1911 they are given by months:

Daily Rate of Pig Iron Production in 1909, 1910 and 1911.—Gross Tons

	Steel Works Furnaces	Merchant Furnaces	Total
1909			
First quarter	37,054	22,341	59,395
Second quarter	40,825	20,299	61,124
Third quarter	51,795	21,487	73,282
Fourth quarter	56,819	27,779	84,598
1910			
First quarter	57,063	27,678	84,741
Second quarter	53,178	25,292	78,470
Third quarter	46,908	21,696	68,604
Fourth quarter	41,043	21,767	62,810
1911			
January	36,401	20,351	56,752
February	42,349	21,741	64,090
March	48,970	21,066	70,036
April	47,805	21,031	68,836
May	42,270	18,809	61,079
June	42,708	16,877	59,585
July	42,472	15,369	57,841
August	47,120	15,030	62,150
September	49,696	16,207	65,903

Taking the pig iron figures as an index, it is plain that the decline in finished material prices this year has not resulted in any such demand as may be compared with the great restocking movement of 1909 which culminated at the end of that year. With no such impetus from stock replenishment this year or any early prospect of it, a repetition of the vaulting curve of 1909 is not imminent.

The Educational Value of an Export Trade

A feature of an export trade in connection with a manufacturing business is its educational value; and this is a contribution made by the export trade which is not as generally recognized as it should be. The educational feature of the domestic business is too common, too much a part of the business, to be recognized as a feature at all. One cannot avoid learning a great deal when conducting any kind of business; and if one could avoid learning he would find still greater difficulty in avoiding bankruptcy. This acquisition of knowledge being so intimately associated with the conduct of the business, it is easy to miss the conception that the addition of an export trade adds an educational course of its own, and that such additional course can hardly fail to be of great advantage.

In the sale of goods, each new market opened up is expected to bear its own expense and is not usually credited with contributing to the prosperity of the general business as pertaining to the supplying of the older markets. For instance, a manufacturer who has been selling his goods in a certain number of nearby states will not ordinarily decide upon carrying his selling campaign into an additional state unless the additional business promises to pay all the expenses and furnish a profit, or at least avoid a loss. Similarly he will not ordinarily add a new product to his list of manufactures unless there is reasonable assurance that in time the business in the new product will pay all the expenses involved.

There is a natural disposition to follow the same principle in canvassing the prospective advantages of an export business. Of course all manufacturers are quick to see that an export business may be conducted at a loss, when charging to it its own expenses and the proportion of the total manufacturing cost, and yet be an advantage by the additional output lowering the average cost of production on the entire output. That is a principle which has come to be well recognized and which needs no defense or exploitation at this time.

The educational value of conducting an export trade, on the other hand, is one which needs to be more generally recognized. If the profits directly accruing to the export trade, or the reductions in cost of manufacture due to larger output, are to be charged with the entire expense involved in conducting the export trade, an injustice is usually done in the accounting, for a great deal of the information which must be gathered in connection with the export trade, and much which naturally accrues in the conduct of that branch of the business, is of direct value in conducting the entire business, or the domestic branch of it.

The alert manufacturer almost always profits by coming in contact with purchasers whose wants are different from those of his old customers. He obtains ideas which sometimes he can put in practice and make his goods more salable to his old customers. He ascertains what his competitors are doing. He recognizes that without knowing what his competitors are doing he cannot hope to hold a competitive market. If the competitor is met in a foreign field, there may easily be ideas which are new in the domestic field, and once they are acquired they can sometimes be used in the domestic field, in which case the manufacturer will find himself armed with an idea which is new to his competitors, giving him an advantage over them in the domestic field. He is led to study

the processes of manufacture used by the foreign competitors, their costs of production and all the features connected with their business. Such knowledge cannot fail to be of some benefit in conducting the entire business, domestic as well as foreign, thereby making a direct contribution to the success of the domestic business; although, according to the more common habit of thought, the entire expense and trouble involved in the acquisition of such knowledge would be charged to the export sales branch.

That our manufacturing industries require a large export trade is being preached everywhere, but the spirit of nearly all this preaching is simply that the country requires a larger favorable balance in the foreign trade, and the individual manufacturers require larger outlets in order to engage their productive capacity more fully. It is always intimated that we must pare our costs and learn from the competitors met in the foreign fields; but the spirit of all this is generally that the improvements we should make are called for solely through our wishing to export. The export trade does not by any means furnish the full measure of the advantages thus to be obtained. The domestic trade is directly benefited by costs being reduced, quality improved or the character of goods made more attractive to buyers.

The statement of the value of traveling as a means of broadening the mind is a truism. Precisely the same principle applies in the cultivation of foreign markets. In traveling, the ideas gained, the knowledge obtained, the mental training involved, are not of value to the possessor purely, or chiefly, because he is to travel more in his lifetime. He brings home with him certain definite assets, which are of use at home. They are assets which could not be acquired at home. Similarly the manufacturer who exports has his horizon broadened, obtains new ideas and in various ways better fits himself for the conduct of his domestic business. In estimating the rewards of an export trade the value of this educational course should not be overlooked, but should be credited as one of the offsets to the expense and trouble involved in conducting the export business.

The Lime Light on Factory Lighting

It is a singular fact that for a number of weeks associations meeting in New York City have each one given conspicuous attention to the matter of shop lighting. The fact is one of the signs of the times, emphasizing the attention being paid to the human factor in manufacturing. The question is not discussed solely from the standpoint of gaining clear vision, but from the relation of light to human endeavor. Illumination is now studied as a science, and this development owes itself to specialization in the electrical field, with the early formation of a national illuminating engineering society and the appearance in engineering circles of engineering specialists in illumination.

Recent issues of this journal have reported the general views of some of those making a special study of shop-lighting problems. It is not likely that the subject will be overdone in itself, particularly as there are so many other concomitant features of plant operation requiring attention. It is probable that the emphasis placed on the tungsten lamp as a panacea may be too great and may develop the same suspicions

that followed the enthusiasm accorded other forms of lights which had their day and were then regarded as the last word in lamps. It is worth while noting, however, that the present favored lamp has made it possible commercially to market a series of lamps of different lighting power so that almost any condition of lighting may readily be met.

The serious consideration which lighting is given, the corps of specialists in electrical companies in a position to give valuable assistance and the consulting specialists awaiting the call of the factory owner, certainly argue that the time has passed when their recommendations will be listened to and then carefully disregarded. It is pointed out that periodic attention to lighting equipment is highly beneficial and an insignificant item from the cost standpoint. Proper distribution and diffusion also are recognized of importance, particularly with reference to the human factor, a little increase in lighting cost being calculated as increasing very largely the value of the worker.

The Tin Plate Imports and Exports

One of the most interesting developments in our foreign trade this year is the decline in imports and the increase in exports of tinplates. We are now exporting considerably more than we are importing. For the eight months ended with August the exports of tinplates were 36,094 gross tons, while the imports were but 12,706 tons. In the corresponding period of 1910 the exports were but 7,586 tons, while the imports were 51,082 tons. The reversal of trade in this product has therefore occurred this year for the first time. In July and August the imports totaled but 533 tons, against exports of 10,517 tons. This great change is partly due to the growth of our export trade in tinplates with contiguous countries, and partly to the capture by domestic tinplate manufacturers of the very important business done by packers. They have long purchased foreign tinplates for making cans to hold their exported products, thus getting the benefit of the drawback in the tinplate duty when the cans were exported.

The Buying of Replacement Parts

Users of machinery fare best who buy repair parts directly from the manufacturer. Often they save in the cost and almost always they save time, which in many cases is the equivalent of money. The modern machine tool builder regards the replacement of parts of his machines with jealous care. Generally speaking, he desires no profit in this department of his sales. He knows that each item of repair is charged up against the individual machine, and that the higher the total of this cost the greater the handicap that his product must carry when the customer again enters the market. Wherever there is a good cost system—and the exceptions are becoming fewer every year—a record of all these details of expense is maintained, together with the idle time resulting from repairs, so that a tool has a good or indifferent or bad name as the case may be. Consequently, the machine builder resents the purchase of repair parts from a middleman, if the transaction means increased cost to the user or increased delay in delivery. The well-balanced shop is usually prepared to make immediate shipment of replacements, on the theory that every day lost in production is an argument against the efficiency of a tool.

The usual custom nowadays is to consider a question of repairs from one of several well-defined viewpoints. If a part proves defective in material or workmanship the builder cheerfully bears the expense. If the user is to blame, through the negligence or carelessness of an operator, he is charged the exact cost price. The question of responsibility may have to be adjudicated, but the principle is unchanged. If, however, a machine is of an old model and has had a useful existence covering a number of years since it left the shop of its builder, the latter may feel warranted in charging a snug profit, and the soundness of the position cannot reasonably be assailed. In this way the repair account of the machine tool manufacturer is kept within reasonable limits. But the indirect loss may be large, in the way of depreciated good-will. To minimize this is the constant aim of the well-organized sales department. Usually a point is strained in favor of the customer. In certain branches of machinery the repair part still plays an important revenue-creating part, but with the basic tools—the machines which make machines—a good name is considered an essential factor.

Correspondence

Ferrotitanium and Its Use

To the Editor: Referring to the letter by Dr. G. B. Waterhouse in *The Iron Age* issue of July 27 on the subject of ferrotitanium, I note that he says that ferrotitanium containing 5 to 8 per cent. carbon has only a very small amount of the carbon content combined with the titanium as titanium carbide, and that by far the largest part occurs as graphitic carbon in the alloy. The writer cannot agree with this as, in his opinion, only the excess of carbon crystallizes out as graphite in the production of this alloy.

Benefit of Carbon-Free Alloys

This opinion is supported by the famous French metallurgist, Moissan, in his book, "The Electric Furnace." The excess of carbon in this alloy is great, as only about 3 to 4 per cent. carbon is required for 12 to 15 per cent. titanium to form titanium carbide. On account of the carbide content, the alloy is not easily soluble, as it is a well-known fact that carbides dissolve with great difficulty in iron or steel, particularly titanium and vanadium carbide. The accuracy of this opinion is well established by practice, and there are many users of the 10 to 15 per cent. ferrotitanium with 5 to 8 per cent. carbon who have found from experience that a considerable part of the alloy does not dissolve at all but rises to the surface and is found afterward imbedded in the slag and, therefore, wasted. No case is known where this has happened with the carbon-free alloy. The user of the carbon-free alloy derives the full benefit of the titanium content, as there are no carbides at all in the alloy, neither of titanium nor iron.

Ferroalloys should be free from carbon, whether ferrochromium, ferrotungsten, ferrotitanium or ferrovanadium. No steel maker now uses ferrovanadium containing 5 to 6 per cent. carbon, as he knows only too well that the carbon is combined with the vanadium to form vanadium carbide, and this does not dissolve in iron or steel but is wasted in the slag. It is the same with titanium, and those who use both the carbon-free ferrotitanium and that containing carbon will find that the above statements are correct.

In the last paragraph of this article Dr. Waterhouse says, referring to the carbonaceous alloy, "the alloy quickly dissolves because of its low melting point." Now solubility and melting point are two entirely different things, and it is only necessary to state here a few examples where one metal will not dissolve in another, although heated far above its melting point. This is very clearly shown in the case of lead and copper. Lead has a melting point of 330 deg. C. (628 deg. F.), and copper a melting

point of 1098 deg. C. (2008 deg. F.), yet an effort to produce an alloy of copper and lead would not be successful without the aid of a flux.

On the other hand, there are many metals with high melting points which easily and quickly dissolve in others of low melting points. This is shown conclusively in the case of carbon-free manganese, which, in spite of its melting point of 1245 deg. C. (2273 deg. F.), alloys especially easily with copper; in fact, more easily than manganese containing carbon.

The 20 to 25 per cent carbon-free ferrotitanium dissolves very easily, although its melting point is a little higher than the 10 to 15 per cent, carbonaceous ferrotitanium. This fact makes the carbon-free alloy extraordinarily suitable for use in the ladle or runner—the best way to use any deoxidizing ferroalloy.

With reference to the analysis of the carbon-free alloy given by Dr. Waterhouse, showing 7 to 8 per cent. silicon, I would like to say that this was made for a special purpose, and it is certainly not suitable for all purposes. The average silicon content of the alloy is 1.2 to 1.5 per cent. and is, therefore, lower than that of the 10 to 15 per cent. ferrotitanium in comparison with the titanium content.

High Aluminum Content

In regard to the aluminum content of the carbon-free alloy, I might say that in former years the alloy was used with a lower aluminum content, but practice has shown that the higher aluminum content gives better results, and makes the use of ferrotitanium more economical. Dr. Waterhouse's opinion that the high aluminum content might be extremely harmful is, it would appear to me, theoretical, especially when the alloy is used in the ladle. When sufficient time is allowed for the aluminum oxide to pass into the slag, no harm can possibly result. If it were harmful, why do most steel makers use aluminum as a deoxidizing agent in their steel?

The addition of aluminum to carbon-free ferrotitanium containing 25 per cent. titanium is intentional and decidedly useful. This is brought out in a letter published by Dr. Hans Goldschmidt in the October number of *Metallurgical and Chemical Engineering*. In this letter he states that titanic acid is well known to be very difficult of fusion and for this reason the titanic acid, which is formed by the ferrotitanium (if alone present), separates out only with difficulty. If, however, alumina is produced together and simultaneously with titanic acid, the two react together at once, forming aluminum titanate, which is more easily fusible than titanic acid, also more easily fusible than alumina.

Aluminum, used to such a large extent in the steel industry, has also the disadvantage that its oxide alone is fusible only with great difficulty and does not separate out easily. By microphotographic methods it is easy to show the small particles of alumina inclosed in steel.

Aluminum Titanate Gives a Fusible Slag

A simple experiment shows that aluminum titanate gives a much more fusible slag than either titanic acid alone or alumina alone. If one tries to melt pure alumina alone and pure titanic acid alone in a clay pot or in a small shallow crucible by means of the oxy-acetylene flame, either oxide alone will refuse to melt except if the flame be applied for a very long time and concentrated directly on the oxide, but even then it will only be possible to melt together small globules.

But if now the two oxides are mixed together, say in the ratio of three to four parts of titanic acid to one part of alumina (that is in the same proportion in which the two oxides are formed in the oxidation of carbon-free ferrotitanium, containing aluminum and made by the aluminothermic method), the two oxides together will melt in a very short time. This simple experiment shows clearly the advantages of the aluminum content of ferrotitanium.

In cases where steel contains a large proportion of oxides, which could be deoxidized much better by means of aluminum, if this were present, the titanium has to be this deoxidizer and it is consumed uselessly as such, either in whole or in part. In order to avoid this useless and more expensive consumption of the titanium, aluminum is added simultaneously with titanium, in the case of the

carbon-free ferrotitanium, so that all the impurities and oxides are first reduced by the aluminum. When this is done the titanium can manifest its own effect more strongly.

Another Advantage of Carbon-Free Alloy

Another great advantage of the carbon-free alloy lies in the fact that it is always uniform in quality and density and perfectly free from slag. This can hardly be said of the 10 to 15 per cent. ferrotitanium containing 5 to 8 per cent carbon. Judging from the material that the writer has seen being used by consumers, it is often very irregular in structure, some of it being apparently dense and undoubtedly of the specific gravity mentioned by Dr. Waterhouse, but a large percentage of it is of a porous, spongy character, which would hardly work itself through any considerable layer of slag and might even tend to float on a metal bath and thus be wasted. This porous material has a slag-like fracture and appears to contain melted titanium oxide, which would hardly be a beneficial addition to molten steel.

There can be no doubt that with the aluminothermic process a much more complete separation of metal and slag is obtained than in the electric furnace. In the latter the metal and slag melt drop by drop, while with the thermit process the heat developed is so great that everything is melted at once and, therefore, a much more uniform metal is obtained.

The high titanium content of the carbon-free alloy is of great importance, especially if the ferrotitanium is added to the ladle. In many cases it is necessary to add from 400 to 500 lb. of ferromanganese, and where this is done it is a great advantage to add only 100 lb. of the carbon-free 20 x 25 per cent. ferrotitanium, instead of 200 lb. of the 10 to 15 per cent. alloy. For this reason many steel manufacturers prefer the higher per cent. ferrotitanium, as not nearly so much heat is required to melt it, with the result that the temperature of the steel is not reduced to the extent that it would be otherwise. The slightly higher melting point of the 20 to 25 per cent. ferrotitanium does not amount to anything in comparison with the amount of heat required for melting the double weight of alloy.

Dr. Waterhouse's opinions, as expressed in his letter, are particularly interesting, as the subject is one which is now being very generally discussed, and I trust that his further investigations may show him the correctness of my views.

WILLIAM R. HULBERT.

NEW YORK, October 5, 1911.

National Founders' Association.—Announcement is made that the fifteenth annual convention of the National Founders' Association will be held at the Hotel Astor, New York, Wednesday and Thursday, November 15 and 16. The Administrative Council will hold a meeting on Tuesday, November 14, and the alumni dinner will be held Tuesday evening. Prominent speakers have been engaged for the annual banquet on Wednesday evening and committees are now arranging a programme of papers and discussions for the convention.

The Bignall & Keeler Mfg. Company, Edwardsville, Ill., manufacturer of pipe threading machines, is changing its entire line of pipe machines over to single pulley drive. The different speeds are obtained by shifting gears in the gear box and the positions of the different levers are shown by a speed plate. All gears are covered to protect workmen. The weight of practically all the machines has been increased to provide for the use of high speed steel in the dies.

The Mumford Molding Machine Company, Plainfield, N. J., announces its appointment of James T. Lee, formerly of the Hanna Engineering Works, as its Chicago representative, with address at 2059 Elston avenue, Chicago.

The annual meeting of the stockholders of the Republic Iron & Steel Company will be held in Jersey City, N. J., October 18. Four directors will be elected for three years.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

FIG IRON, Per Gross Ton:	Oct. 11, 1911.	Oct. 4, 1911.	Sept. 13, 1911.	Oct. 12, 1910.
Foundry No. 2 standard, Philadelphia.....	\$15.00	\$15.00	\$15.00	\$15.75
Foundry No. 2, Valley furnace.....	13.50	13.25	13.50	14.00
Foundry No. 2 Southern, Cincinnati.....	13.25	13.25	13.25	14.25
Foundry No. 2, Birmingham, Ala.....	10.00	10.00	10.00	11.00
Foundry No. 2, at furnace, Chicago.....	14.50	14.50	14.50	16.00
Basic, delivered, eastern Pa.....	14.50	14.50	14.75	15.00
Basic, Valley furnace.....	12.50	12.60	13.00	13.10
Bessemer, Pittsburgh.....	15.40	15.55	15.90	15.90
Gray forge, Pittsburgh.....	13.65	13.65	13.90	14.15
Lake Superior charcoal, Chicago.....	16.50	16.50	16.50	18.25

COKE, CONNELLSVILLE,

Per Net Ton, at Oven:	Oct. 11, 1911.	Oct. 4, 1911.	Sept. 13, 1911.	Oct. 12, 1910.
Furnace coke, prompt shipment.....	1.50	1.50	1.50	1.60
Furnace coke, future delivery.....	1.60	1.60	1.60	1.70
Foundry coke, prompt shipment.....	1.80	1.85	1.85	2.10
Foundry coke, future delivery.....	2.00	2.10	2.10	2.25

BILLETS, &c., Per Gross Ton:

Bessemer billets, Pittsburgh.....	20.00	20.00	21.00	24.00
Open hearth billets, Pittsburgh.....	19.00	19.00	21.00	24.50
Forging billets, Pittsburgh.....	25.00	25.00	26.00	29.00
Open hearth billets, Philadelphia.....	21.40	21.40	23.40	26.00
Wire rods, Pittsburgh.....	26.00	26.00	27.00	28.50

OLD MATERIAL, Per Gross Ton:

Iron rails, Chicago.....	13.75	13.75	14.50	16.00
Iron rails, Philadelphia.....	16.50	16.50	17.00	18.00
Car wheels, Chicago.....	12.50	12.50	12.75	14.00
Car wheels, Philadelphia.....	11.75	11.75	12.75	13.75
Heavy steel scrap, Pittsburgh.....	12.00	12.25	12.75	14.25
Heavy steel scrap, Chicago.....	10.00	10.00	10.50	12.25
Heavy steel scrap, Philadelphia.....	12.00	12.00	13.00	13.75

FINISHED IRON AND STEEL,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill.....	1.25	1.25	1.25	1.25
Iron bars, Philadelphia.....	1.22½	1.22½	1.27½	1.40
Iron bars, Pittsburgh.....	1.20	1.20	1.25	1.45
Iron bars, Chicago.....	1.20	1.20	1.22½	1.35
Steel bars, Pittsburgh.....	1.15	1.15	1.20	1.40
Steel bars, tidewater, New York.....	1.31	1.31	1.36	1.56
Tank plates, Pittsburgh.....	1.20	1.20	1.30	1.40
Tank plates, tidewater, New York.....	1.36	1.36	1.46	1.56
Beams, Pittsburgh.....	1.20	1.25	1.35	1.40
Beams, tidewater, New York.....	1.36	1.41	1.51	1.56
Angles, Pittsburgh.....	1.20	1.25	1.35	1.40
Angles, tidewater, New York.....	1.36	1.41	1.51	1.56
Skelp, grooved steel, Pittsburgh.....	1.15	1.15	1.20	1.40
Skelp, sheared steel, Pittsburgh.....	1.25	1.25	1.30	1.50

SHEETS, NAILS AND WIRE,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh.....	1.85	1.85	1.90	2.20
Wire nails, Pittsburgh.....	1.65	1.65	1.65	1.70
Cut nails, Pittsburgh.....	1.50	1.50	1.60	1.65
Barb wire, galv., Pittsburgh.....	1.95	1.95	1.95	2.00

METALS,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.....	12.50	12.50	12.75	12.87½
Electrolytic copper, New York.....	12.25	12.25	12.37½	12.75
Spelter, St. Louis.....	6.00	5.85	5.90	5.45
Spelter, New York.....	6.15	6.00	6.05	5.60
Lead, St. Louis.....	4.10	4.32½	4.40	4.27½
Lead, New York.....	4.25	4.47½	4.50	4.40
Tin, New York.....	41.25	40.15	39.75	.....
Antimony, Hallett, New York.....	7.70	7.70	7.75	7.87½
Tin plate, 100-lb. box, New York.....	\$3.84	\$3.84	\$3.84	\$3.84

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

†These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.15c. to 1.20c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼ in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge.....	10
Gauges under 3-16 in. to and including No. 8.....	15
Gauges under No. 8 to and including No. 9.....	25
Gauges under No. 9 to and including No. 10.....	30
Gauges under No. 10 to and including No. 12.....	40
Sketches (including all straight taper plates) 3 ft. and over in length.....	10
Complete circles, 3 ft. in diameter and over.....	20
Boiler and flange steel.....	10
"A. B. M. A." and ordinary firebox steel.....	20
Still bottom steel.....	30
Marine steel.....	40
Locomotive firebox steel.....	50
Widths over 100 in. up to 110 in., inclusive.....	35
Widths over 110 in. up to 115 in., inclusive.....	45
Widths over 115 in. up to 120 in., inclusive.....	55
Widths over 120 in. up to 125 in., inclusive.....	65
Widths over 125 in. up to 130 in., inclusive.....	75
Widths over 130 in.....	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive.....	25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive.....	50
Cutting to lengths or diameters under 1 ft.....	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in. on one or both legs, ¼ in. and over, 1.20c. to 1.25c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.....	1.35 to 1.40
H-beams over 18 in.....	1.45 to 1.50
Angles, 3 to 6 in., inclusive, ¼ in. and up.....	1.25 to 1.30
Angles over 6 in.....	1.35 to 1.40
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras as per steel bar card Sept. 1, 1909.....	1.30 to 1.35
Tees, 3 in. and up.....	1.30 to 1.35
Zees, 3 in. and up.....	1.25 to 1.30
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909.....	1.30 to 1.35
Deck beams and bulb angles.....	1.55 to 1.60
Hand rail tees.....	2.45
Checkered and corrugated plates.....	2.45

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows:

Blue Annealed Sheets.	Cents per lb.
Nos. 3 to 8.....	1.25 to 1.30
Nos. 9 and 10.....	1.35 to 1.40
Nos. 11 and 12.....	1.40 to 1.45
Nos. 13 and 14.....	1.45 to 1.50
Nos. 15 and 16.....	1.55 to 1.60

Box Annealed Sheets, Cold Rolled.	One Pass.	Three Pass.
Nos. 10 to 12.....	1.50 to 1.55	.....
Nos. 13 and 14.....	1.55 to 1.60	.....
Nos. 15 and 16.....	1.60 to 1.65	1.70 to 1.75
Nos. 17 to 21.....	1.65 to 1.70	1.75 to 1.80
Nos. 22, 23 and 24.....	1.70 to 1.75	1.80 to 1.85
Nos. 25 and 26.....	1.75 to 1.80	1.85 to 1.90
No. 27.....	1.80 to 1.85	1.90 to 1.95
No. 28.....	1.85 to 1.90	1.95 to 2.00
No. 29.....	1.90 to 1.95	2.00 to 2.05
No. 30.....	2.00 to 2.05	2.10 to 2.15

Galvanized Sheets, of Black Sheet Gauge.	
Nos. 10 and 11.....	1.85 to 1.90
Nos. 12, 13 and 14.....	1.95 to 2.00
Nos. 15, 16 and 17.....	2.10 to 2.15
Nos. 18 to 22.....	2.25 to 2.30
Nos. 23 and 24.....	2.35 to 2.40
Nos. 25 and 26.....	2.55 to 2.60
No. 27.....	2.70 to 2.75
No. 28.....	2.85 to 2.90
No. 29.....	2.95 to 3.00
No. 30.....	3.15 to 3.20

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29.....	.....	\$2.30	23.....	\$2.35	\$3.45
28.....	\$1.30	2.45	22.....	2.55	3.65
27.....	1.45	2.50	21.....	2.75	4.00
26.....	1.55	2.60	20.....	3.00	4.30
25.....	1.80	3.00	18.....	4.60	5.65
24.....	2.05	3.10	16.....	4.85	6.45

Wire Rods and Wire.—Bessemer, open hearth and chain rods, \$26 to \$26.50. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, \$1.45; galvanized, \$1.75. Carload lots, to retailers, annealed, \$1.50; gal-

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vanized, \$1.80. Galvanized barb wire to jobbers, \$1.95; painted, \$1.65. Wire nails, to jobbers, \$1.65.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.								
Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	\$1.65	\$1.70	\$1.75	\$1.80	\$1.90	\$2.00	\$2.10	\$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Stone Ware in Bundles, Discount from Standing List.

Bright and Annealed:

9 and coarser	80
10 to 18	80 and 10
19 to 26	80 and 10 and 2½
27 to 36	80 and 5

Galvanized:

9 and coarser	75 and 10
10 to 16	75 and 10
17 to 26	72½ and 10
27 to 36	72½

Coppered or Liquor Finished:

9 and coarser	75 and 10
10 to 26	75 and 10
27 to 36	70 and 10 and 5

Tinned:

6 to 18	75 and 10 and 10
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Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 2, 1911:

	Steel		Iron	
	Black	Galv.	Black	Galv.
¾ and 1 in.	73	53	68	48
1 in.	74	64	69	59
1½ in.	77	67	75	65
2 in. to 1½ in.	80	72	75	67
2 in. to 3 in.	81	74	76	69

Lap Weld.

1½ and 1½ in.	77	68	61
2 in.	77	70	65
2½ to 4 in.	79	72	67
4½ to 6 in.	78	70	65
7 to 12 in.	76	66	61
13 to 15 in.	52	47	..

Butt Weld, extra strong, plain ends, card weight.

¾, 1, 1½ in.	70	60	65	55
1½ in.	75	69	70	64
¾ to 1½ in.	79	73	74	68
2 to 3 in.	80	74	75	69

Lap Weld, extra strong, plain ends, card weight.

1½ in.	76	66	60
2 in.	76	70	65
2½ to 4 in.	78	72	67
4½ to 6 in.	77	71	66
7 to 8 in.	70	60	55
9 to 12 in.	65	55	50

Butt Weld, double extra strong, plain ends, card weight.

¾ in.	65	59	60	54
¾ to 1½ in.	68	62	63	57
2 to 3 in.	70	64	65	59

Lap Weld, double extra strong, plain ends, card weight.

2 in.	66	60	61	55
2½ to 4 in.	68	62	63	57
4½ to 6 in.	67	61	62	56
7 to 8 in.	60	50	55	45

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld	will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.
2, 2½ to 4 in. Lap Weld	

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Pittsburgh

PITTSBURGH, October 11, 1911.—(By Telephone.)

Pig Iron.—We are asked to state by the Standard Sanitary Mfg. Company that reports that it is in the market for 22,000 tons of foundry and forge iron are untrue. This company has all the iron that it will need for some time to come for its Allegheny and Louisville works. The local pig iron market is very dull, the only inquiry out being one for 500 to 1000 tons of malleable Bessemer for October and November delivery. Prices are weak and not enough new business is being offered to test the market. Several Valley furnaces are offering Bessemer iron freely at \$14.50 and basic at \$12.50 at furnace. We quote Bessemer iron at \$14.50 to \$14.65; basic, \$12.50 to \$12.60; malleable Bessemer, \$13 to \$13.25; No. 2 foundry, for the remainder of the year, \$13.50, and gray forge, \$12.75, all at Valley furnace, the freight rate to Pittsburgh district being 90 cents a ton.

Steel.—The lower prices ruling on billets and sheet bars are causing consumers to take more interest in the market, and some inquiries are out for billets and bars for delivery over the remainder of this year and into the first quarter of next year. Specialties against con-

tracts are coming to the mills at a fair rate. Prices are unchanged and we quote open hearth billets, \$19; Bessemer billets, \$20; open hearth sheet bars, \$20; Bessemer sheet bars, \$21, and forging billets, \$25, f.o.b. at maker's mill. The steel mills are no longer quoting prices f.o.b. Pittsburgh or Youngstown, but are all quoting f.o.b. at maker's mill, adding the freight to the point of delivery. We note a sale of 1000 tons of open hearth billets of special quality at \$20, delivered, equal to about \$19.50 at maker's mill.

Steel Rails.—The Carnegie Steel Company has sold 1400 tons of standard section to a Western road for prompt delivery.

Merchant Pipe.—The Ohio Fuel Supply Company has bought 10 miles of 4 to 8-in. steel pipe and the Philadelphia company 5 miles of 6-in. iron pipe.

(By Mail.)

New inquiries and specifications against contracts are reported as coming in a little better, but consumers are still placing orders cautiously, taking only such quantities as are absolutely required to meet current needs. Prices have gone to a still lower level in the past week and are believed now to be very close to bottom. Plates have sold at 1.15c. to 1.20c., structural material seems to have settled down to 1.20c., and steel bars, while generally quoted at 1.15c., have sold in some cases at 1.10c., at mill. The new discounts on pipe and boiler tubes are reported to be quite well maintained and the specifications of two pipe mills up to to-day are slightly ahead of those for the same period last month. Car orders have been a little better and several good-sized inquiries are out. Some pretty heavy work is coming up, which, if it goes through, will take a good tonnage of plates.

Ferromanganese.—Sales are reported of 300 to 400 tons for delivery in last quarter at about \$37, Baltimore, while for first quarter shipment most importers are asking \$37.50 to \$38, Baltimore. The freight rate for delivery in the Pittsburgh district is \$1.95 a ton.

Ferrosilicon.—Prices on 50 per cent. are higher than last week's. We note sales of about three carloads for early shipment on the basis of \$59, and we quote \$59 to \$60, Pittsburgh. Two blast furnaces have recently gone into the manufacture of ferrosilicon and prices are being cut to some extent. We quote 10 per cent., \$22; 11 per cent., \$23; and 12 per cent., \$24, f.o.b. cars Ashland, Ky., or Jackson, Ohio.

Muck Bar.—While prices are not very firm, we quote best grades made from all pig iron at \$28 to \$28.50, delivered at buyers' mill in the Pittsburgh district.

Skelp.—The market is very quiet and a local mill that rolls both steel and iron skelp has closed down for lack of orders. A sale of 1000 tons of narrow grooved steel skelp is reported at 1.10c., at makers' mill, equal to about 1.15c., Pittsburgh. We quote grooved steel skelp at 1.15c.; sheared steel skelp, 1.20c.; grooved iron skelp, 1.40c., and sheared iron skelp, 1.60c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—New inquiry is very dull, and several large makers of rods having contracts with consumers made several months ago state that specifications are coming in at a very unsatisfactory rate. We quote Bessemer, open hearth and chain rods at \$26 to \$26.50, f.o.b. Pittsburgh, but the market is weak.

Steel Rails.—It is reported that one of the leading roads has placed a rail order for 24,000 tons, part of which is to be rolled by the local mill. The Carnegie Steel Company has received in the past two or three weeks some very good orders for standard sections for export. New demand and specifications against contracts for light rails are fairly active, the Carnegie Steel Company having booked about 3200 tons in the past week.

Plates.—More car orders have been placed in the past week than for some time and good sized inquiries are out. In addition to the Missouri Pacific orders amounting to 2400 cars the Louisville & Nashville has placed 500 steel underframes with the Pressed Steel Car Company and 500 with the Mount Vernon Car Company. Active inquiries include 386 steel underframes for the Buffalo, Rochester & Pittsburgh, 300 steel underframe automobile cars for the Erie, 500 steel underframe furniture cars and 250 steel underframe flat cars for the Chicago, Rock Island & Pacific, 987 steel underframes for the Delaware, Lackawanna & Western, 1000 underframe box cars for the New York Central, 200 steel hoppers for the Cambria & Indiana, 40 suburban pas-

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senger cars for the Long Island and 75 to 100 passenger cars for the Pennsylvania. The low prices ruling on plates are of interest to boat builders, and it is stated that several large contracts for boats for the ore trade and for freight service are under negotiation. While we quote wide and narrow plates at 1.20c., Pittsburgh, this price can be shaded on very desirable specifications and for shipment at the convenience of the mill.

Structural Material.—Bids are going in on some pier sheds at New Orleans, about 300 tons.. The American Bridge Company has taken 800 tons of bridge work for the Wabash Railroad. We quote beams and channels up to 15 in. at 1.20c., f.o.b. Pittsburgh, but on desirable specifications and for prompt shipment 1.15c. has been done in some cases.

Bars.—New orders for both iron and steel bars continue light, being mostly for small lots to cover actual needs, and consumers are specifying against contracts at only a fairly satisfactory rate. Consumers and jobbers are taking in as little as possible until conditions are more settled. The open market on steel bars is 1.15c., but on desirable specifications 1.10c. is being done. It is stated that steel bars at 1.10c. are about as low as they have ever been, taking present labor and raw material costs into account. We quote steel bars at 1.10c. to 1.15c., the lower price being made only in some cases and for desirable orders. We quote common iron bars at 1.20c. to 1.25c., f.o.b. at mill, Pittsburgh.

Sheets.—As far as new orders and specifications against contracts are concerned conditions in this trade are fairly good, most of the mills running to an average of about 70 per cent. of capacity. The leading sheet mills generally are pursuing the policy of running full for a week or two and then shutting down until enough orders accumulate to warrant starting up again full time. Some sellers report that on No. 28 black one pass, box annealed sheets, they are able to get 1.90c. on most of their orders, and it takes a very desirable specification to bring out the price of 1.85c. Galvanized sheets are possibly a little stronger, owing to the higher prices ruling for spelter. A pretty large tonnage of sheets is now being sold for export and heavy shipments have recently been made to Canada.

Tin Plate.—Between October 15 and 20 it is probable that the meat packers will come in the market to place contracts for their tin plate requirements running through the first quarter and into the first half of next year. Indications are that \$3.60 per base box for 100-lb. cokes will be the basis of quotations on these contracts. Specifications against contracts have been coming in quite freely so far this month. The leading mills are operating at present to only about 60 per cent. of capacity, and it is very evident that a large productive surplus exists which must remain idle until consumption is much heavier. We quote 100-lb. cokes at \$3.60 per base box, f.o.b. Pittsburgh.

Merchant Steel.—Consumers and jobbers are placing orders from hand to mouth, keeping stocks as low as possible in the belief that prices have not yet reached bottom. Quotations, which are more or less shaded, are as follows: Iron finished tire, $\frac{1}{4}$ and $\frac{1}{2}$ in. and heavier, 1.40c.; under these sizes, 1.45c.; planished tire, 1.50c.; channel tire, 1.70c., base; toe calk, 1.80c.; flat sleigh shoe, 1.45c.; concave or convex, 1.60c.; cutter shoe, tapered or bent, 2.15c.; spring steel, 1.85c.; machinery steel, smooth finish, 1.75c.

Hoops and Bands.—The quotation of 1.25c. on steel hoops in this report last week was a typographical error and should have been 1.35c. New orders for both hoops and bands are light and only for small lots to cover actual needs, while specifications are not coming in at a satisfactory rate. We quote steel hoops at 1.35c. and bands at 1.15c., but on desirable orders for prompt shipment these prices would be shaded.

Rivets.—New buying is very light and specifications against contracts are unsatisfactory. We quote structural rivets at 1.55c. to 1.60c. and boiler rivets at 1.65c. to 1.70c., f.o.b. Pittsburgh.

Wire Products.—Conditions in this trade are only fairly satisfactory, new demand being only for small lots, while specifications against contracts are only for such quantities of wire and nails as jobbers or retailers require to meet current needs. The leading wire nail mills continue to bill nails at \$1.70 per keg, but allow customers to deduct 5c. when remitting. We quote wire nails at \$1.65; cut nails, \$1.55; galvanized barb wire, \$1.95; painted, \$1.65; annealed fence wire, \$1.45, and gal-

vanized, \$1.75, all f.o.b. Pittsburgh, usual terms, full freight added to point of delivery.

Spelter.—Prices are higher with a somewhat better demand. We note a sale of two cars, or about 50 tons, for prompt shipment at 5.95c., East St. Louis, equal to 6.07 $\frac{1}{2}$ c., Pittsburgh.

Shafting.—Prices continue at a low level, and we quote cold rolled shafting at 60 and 5 off in small lots and 60 and 10 per cent. off list in carload lots, delivered in base territory.

Railroad Spikes.—The railroads are placing only small orders to cover needs for repair work, and no large inquiries are in the market. We quote railroad spikes in base sizes at \$1.40 to \$1.45, f.o.b. mill, Pittsburgh.

Merchant Pipe.—The contract taken by the United States Steel Products Company from the Western Gas, Light, Heat & Power Company, Calgary, Canada, which is for a natural gas line, will be turned over to the National Tube Company to be rolled at its mills in the Pittsburgh district. The trunk line embraces about 180 miles of 16-in. line pipe, 6 miles of 6-in. screw pipe, 12 miles of 8-in. screw pipe, 12 miles of 16-in. screw pipe, and about 60 miles of 14-in. o. d. down to 6-in. i. d., while the miscellaneous lines embrace 3 miles of 12-in. o. d., 5 miles of 10-in. o. d., 15 miles of 8-in. i. d., 15 miles of 6-in. i. d. and 50 miles of 4 $\frac{1}{2}$ -in. o. d. This is one of the largest contracts for line pipe placed in months. We also note that the Texas Company is in the market for 150 miles of 6-in. line pipe. It is probable the business will go to the Republic Iron & Steel Company, which in the past has furnished a large amount of pipe to this company. The general demand for merchant pipe is fairly active, two leading mills reporting that orders placed so far this month show a slight increase over the same period in December. It is stated that the new discounts on iron and steel pipe are being well maintained.

Boiler Tubes.—New business in both locomotive and merchant tubes is only fair and is still confined to small lots to cover actual needs. It is stated that new discounts on boiler tubes which went into effect some time ago are being maintained. These are printed on a previous page.

Coke.—Both blast furnace and foundry coke continue quiet, but prices are quite firm. Several Valley blast furnace interests continue to buy their supply of coke from month to month and we note sales of about 15,000 tons for delivery in October at \$1.50 per net ton, at oven, for standard grades and also sales of about 25,000 tons of standard grade for November and December delivery at \$1.65 per net ton, at oven. We quote standard makes of furnace coke on contracts for prompt shipment at \$1.50 to \$1.55 and on contracts for remainder of this year at \$1.65 to \$1.70 per net ton, at oven. We quote 72-hr. foundry coke for prompt shipment at \$1.85 and up to \$2, and on contracts from \$2.10 and as high as \$2.40.

Iron and Steel Scrap.—Conditions in this trade are very unsatisfactory, there being practically no demand. The low prices have not stimulated business and consumers are taking in as little scrap as possible. The regular monthly list of the Pennsylvania Railroad came out last week and embraced about 14,000 tons, including 5000 tons of heavy melting steel, on which bids closed on October 10. We have reduced our quotations on some lines, but hardly enough material is moving to fix a market. Prices are as follows per gross ton f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery.	\$12.00 to \$12.25
No. 1 foundry cast.	12.50 to 12.75
No. 2 foundry cast.	12.00 to 12.25
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.25 to 10.50
Re-rolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.00 to 13.25
No. 1 railroad malleable stock.	11.75 to 12.00
Grate bars	9.50 to 9.75
Low phosphorus melting stock.	15.50 to 15.75
Iron car axles.	22.00 to 22.50
Steel car axles.	16.50 to 16.75
Locomotive axles	23.00
No. 1 busheling scrap.	11.50 to 11.75
No. 2 busheling scrap.	8.00 to 8.25
Old car wheels	12.50 to 12.75
Sheet bar crop ends.	13.75 to 14.00
*Cast iron borings.	8.25
*Machine shop turnings.	8.75
Old iron rails	14.50 to 14.75
No. 1 wrought scrap.	13.50
Heavy steel axle turnings.	9.75 to 10.00
Stove plate	9.50 to 9.75

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

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Chicago

CHICAGO, ILL., October, 10, 1911.

Buyers of steel out of store found the chief item of interest during the past week to be the reduction in prices of bars, shapes, plates and sheets. The recent lowering of mill prices had established a wide spread, which has now been met by a general concession on the part of the jobbers of \$2 a ton. The market situation as to prices continues to indicate that mills are using all of their local advantages, particularly of geographical location, to make attractive delivery quotations. Prices show practically no adherence to common basing points, and the market has seldom been more favorable to the buyer. From the sellers' standpoint it is therefore considered to be of unfavorable significance that consumers generally decline to take advantage of the situation beyond immediate needs. Finished steel tonnage is moving in about the same volume as for several weeks past, and the price concessions seem to have been without influence in decreasing or increasing buying. Western rail business was quiet during the week, but the awarding of the Field Museum structural steel contract, involving 10,000 tons, to the Bethlehem Steel Company, and the purchase of 2400 cars by the Missouri Pacific Railroad, requiring some 25,000 tons of plates and shapes, brought encouragement in these lines. The purchase of 4000 tons of malleable pig iron at Chicago and 6000 tons of basic at St. Louis were the exceptions in a quiet pig iron market.

Pig Iron.—Improvement in pig iron buying reported in other districts finds little parallel in the Chicago market. A sale of 4000 tons of malleable to meet the current needs of a large buyer is noted and also an inquiry for 2500 tons of foundry iron. These items stand out sharply from the balance of transactions, which seem to have been limited to quantities not exceeding 300 and 400 tons. Requests for anticipated deliveries from melters are being received in number sufficient to improve the tone of the market somewhat, and contracts upon which iron has been held up for many months are now beginning to be worked out. A tendency toward cleaning up back orders before more iron is purchased may account for both the prompt shipment demands and the lack of buying at this time. From the standpoint of price, the situation offers little to encourage the furnaces. Local iron can now be bought for \$14.50 at furnace, with buyers obtaining an extension of deliveries into the first quarter. Southern iron for the remainder of the year is being sold on a basis of \$10, Birmingham, for No. 2, and while the volume of sales for first quarter delivery is still quite limited, the extension of the low prices into next year seems impossible of avoidance. We quote for Chicago delivery, except for local irons which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal.....	\$16.50 to \$17.00
Northern coke foundry, No. 1.....	15.00 to 15.50
Northern coke foundry, No. 2.....	14.50 to 15.00
Northern coke foundry, No. 3.....	14.25 to 14.50
Northern Scotch, No. 1.....	16.00
Southern coke, No. 1 foundry and No. 1 soft.....	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft.....	14.35 to 14.85
Southern coke, No. 3.....	14.10 to 14.35
Southern coke, No. 4.....	13.85 to 14.10
Southern gray forge.....	13.60 to 13.85
Southern mottled.....	13.60 to 13.85
Malleable Bessemer.....	14.50 to 15.00
Standard Bessemer.....	17.40
Basic.....	15.50
Jackson Co. and Kentucky Silvery, 6 per cent.....	17.90
Jackson Co. and Kentucky Silvery, 8 per cent.....	18.90
Jackson Co. and Kentucky Silvery, 10 per cent.....	19.90

Rails and Track Supplies.—Buying of rails in this market during the week is without important incident. Specifications calling for track fastenings on the contrary continue to come in freely. On the long deferred Missouri Pacific Railroad car inquiry, 1900 steel coal cars were placed with the American Car & Foundry Company and 500 steel underframe box cars with the Mount Vernon Car Company. It is expected that of the remaining 2000 cars unplaced by this road a portion, at least, will be awarded in the near future. The Pullman Company and the Western Steel Car Company are each building 100 refrigerator cars for the Erie Railroad. Light rail business has been very irregular and prices are without any uniform basis. We quote standard railroad spikes at 1.60c to 1.70c, base; track bolts with square nuts, 2.05c. to 2.10c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20

and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—Low prices for structural shapes still prevail, particularly where desirable tonnage is at stake. Some of the smaller fabricators have been encouraged to buy on mill shipment at the low prices, but the aggregate volume of orders fails to indicate any general buying in larger volume as the result of recent concessions. Bethlehem shapes were specified for the Field Museum and about 10,000 tons will be fabricated for this work by the Hansell-Elcock Company, Chicago. Other awards of steel for fabrication included 752 tons for an Illinois River bridge of the Wabash Railroad, to the American Bridge Company; 443 tons for the J. W. Jenkins Sons Company building, Kansas City, to the Kansas City Structural Steel Company; 343 tons for an office and bank building, Hutchinson, Kan., to the Modern Steel Structural Company; 114 tons for transmission line poles for the United States Reclamation Service, to B. F. Kierulff, Jr., & Co., Los Angeles, Cal. In the structural market perhaps more than elsewhere price concessions of widest range may be found. In keeping with reductions in mill quotations announcement was made of a reduction of \$2 a ton on structural shapes out of store, and we now quote for mill shipment, Chicago delivery, 1.43c., and from store, 1.65c.

Plates.—Plate specifications during the week stood out more prominently than those of the other finished lines, due in large measure to requirements for the recently placed car orders. Specifications to cover this material, including shapes and plates, are now being received by the mills. Prices have followed the trend of the market and desirable business can be placed on a basis of 1.25c. Pittsburgh, although less attractive specifications have held at \$1 a ton higher than these prices. In line with the jobbers' reduction on structural shapes, a similar concession is announced for plates, and we quote for Chicago delivery, mill shipment, 1.43c. to 1.48c., and out of store, 1.65c.

Sheets.—Store prices on sheets, both black and galvanized, have been reduced \$1 a ton, and we have revised our quotations below. Little improvement, if any, can be noted regarding the general price situation and in many ways the market seems to be seeking its lowest level. Tonnage is still well sustained, however, though no buying for future requirements can be noted. While buyers apparently feel that at the present time there is no occasion for providing beyond immediate needs, indications show that the market is being watched very closely for a possible turn at the beginning of the year. We quote Chicago prices as follows: Carload lots, from mill: No. 28 black sheets, 2.08c. to 2.13c.; No. 28 galvanized, 3.08c. to 3.13c.; No. 10 blue annealed, 1.63c. Prices from store, Chicago, are: No. 10, 1.95c. to 2c.; No. 12, 2c. to 2.05c.; No. 28 black, 2.40c.; No. 28 galvanized, 3.35c.

Bars.—Interest in steel bars is directed more toward a search for the lowest price obtainable than toward matters of tonnage. Quotations are reported which seem too low for credence, but it cannot be doubted that Western mills are sacrificing their freight advantage to an extent which would bring the equivalent Pittsburgh basis considerably below 1.15c. Conditions apparently do not admit of obtaining more than 1.15c. Pittsburgh, and a major portion of Western business apparently has been placed between 1.25c. and 1.30c. Chicago. Steel bar tonnage is running ahead of bar iron, which latter mills in this territory are operating about 50 per cent of their capacity. Bar iron prices are approximately on a basis of 1.20c., Chicago. Hard steel bars are selling at 1.20c. We have revised store prices and quote as follows, f.o.b. Chicago: Soft steel bars, 1.25c. to 1.33c.; bar iron, 1.20c. to 1.25c.; hard steel bars rolled from old rails, 1.17½c. to 1.20c. From store, soft steel bars, 1.55c. to 1.60c., Chicago.

Wire Products.—The demand for wire nails has been notably irregular, and the bookings from week to week have fluctuated between wide limits. The aggregate sales for the past month did not fall off as much, however, as had been expected. Barb wire is sharing in the very active demand for woven wire fencing and the volume in these products more than offsets any falling off in other lines. Some irregularities in price are encountered, but this may be attributed in a measure, at least, to the wide variety in types of fence. An active pursuit of business on the part of independent interests is a notable feature of the trade. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base,

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Mechanical and Civil Engineers.

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1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—At this season the municipal demand for cast iron pipe ordinarily is light, but it is expected that the low price of pig iron will lead many cities to engage pipe for spring delivery at this favorable period, particularly in view of the easy money situation. The United States Cast Iron Pipe & Foundry Company was the successful bidder for 1700 tons of pipe for Long Beach, Cal., and for 800 tons at Cincinnati. We quote as follows, per net ton, Chicago: Water pipe, 4-in., \$26.50; 6 to 12-in., \$24.50; 16-in. and up, \$24, with \$1 extra for gas pipe.

Old Materials.—The almost complete lack of interest on the part of scrap melters continues to depress the Chicago market. The tonnage changing hands is exceedingly limited and prices have suffered in consequence. Railroad offerings are not extensive and examination of the lists indicates that material previously offered has not been sold and is again offered for bids. Current lists include one from the Chicago, Milwaukee & St. Paul amounting to 1500 tons, of which the principal item is 300 tons of steel rails; 150 tons from the Soo Line, closing October 14; 800 tons from the Wabash, closing October 11, and 12,000 tons from the Baltimore & Ohio. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	\$13.75 to \$14.25
Old steel rails, rerolling	12.25 to 12.75
Old steel rails, less than 3 ft.	11.00 to 11.50
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	12.50 to 12.75
Heavy melting steel scrap	10.00 to 10.50
Frogs, switches and guards, cut apart	10.00 to 10.50
Shoveling steel	9.50 to 10.00
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	\$11.75 to \$12.25
Iron arch bars and transoms	13.25 to 13.75
Steel angle bars	9.00 to 9.50
Iron car axles	17.25 to 17.75
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	10.25 to 10.75
No. 2 railroad wrought	9.25 to 9.75
Steel knuckles and couplers	9.50 to 10.00
Steel springs	10.00 to 10.50
Locomotive tires, smooth	14.00 to 14.50
Machine shop turnings	6.00 to 6.50
Cast and mixed borings	5.25 to 5.75
No. 1 busheling	8.00 to 8.50
No. 2 busheling	6.00 to 6.50
No. 1 boilers, cut to sheets and rings	7.00 to 7.50
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.75 to 9.25
Railroad malleable	9.75 to 10.25
Agricultural malleable	8.75 to 9.25
Pipes and flues	7.25 to 7.75

Philadelphia

PHILADELPHIA, PA., October 10, 1911.

Continued inquiry for plates and shapes from shipbuilders in this district is coming forward and the aggregate amount now being figured on both in the way of definite and prospective business totals over 20,000 tons. There has also been a larger inquiry for structural material, both for bridge and building work, but a considerable portion of the business under negotiation has a string to it. Low prices evidently have much to do with the increased inquiry, plates and shapes being now openly on a 1.40c. basis, delivered here. The pig iron market lacks any important movement.

Iron Ore.—Some little business in foreign ore for early 1912 delivery has been reported. About 50,000 tons of Spanish, for January-February delivery, has been contracted for, and negotiations are pending for other ores. The importations of Swedish ore hereafter will, it is believed, amount to about 500,000 tons a year, including the amount to be delivered on contract to the Bethlehem Steel Company. Importations during the week included 15,537 tons from Norway.

Pig Iron.—From a statistical standpoint the pig iron market in this district shows some improvement. Both the Eastern and the Virginia pig iron associations held their usual monthly meetings last week and reports showed a further decrease of pig iron stocks. A particular feature has been the urgency shown for deliveries, small lot buying and prompt shipment being pronounced. The most important development in the local market has been the practical closing of contracts for the requirements of the Pennsylvania Railroad, the maximum quantity inquired for being taken in most grades. A sale of 1000 tons of coke malleable iron for

this year's shipment is reported at close to \$15.75, delivered. This about cleans up all the pending negotiations for that grade. There has been the usual small lot business in the higher foundry grades, which in some instances has aggregated a very fair total. Standard brands of eastern Pennsylvania No. 2 X foundry command from \$15 to \$15.25, delivered, for shipments extending up to the year end, although in a few instances sellers have extended shipments into January, 1912, at current prices. For strictly first quarter shipment, for which there is more or less inquiry, sellers in this district still refuse to quote. Virginia foundry is moving in small lots, for prompt and fourth quarter delivery, at prices ranging from \$12.25 to \$12.50, furnace. No sales of Virginia foundry for first quarter shipment at the \$12.75, furnace, basis are reported. The cast iron pipe foundries in this district are still placing contracts for low grade iron, although the demand is less aggressive. One block of 5000 tons for this year's shipment at \$14.60, delivered, is reported, together with several sales of lots of a few hundred tons at irregular prices, depending on the character of the iron. Pipe makers would no doubt take on further round lots if their idea of prices, said to be about \$14, delivered, would be met. Small sales of forge iron for rolling mill purposes are reported, while one inquiry for several thousand tons for early shipment is being figured on. The demand for steel making grades has again quieted down, no fresh inquiry for basic iron is reported. Small sales of standard analysis low phosphorus iron continue to be made at \$20, delivered here. The following range of prices is named for standard brands, delivered in buyers' yards in this district during the remainder of the year:

Eastern Pennsylvania No. 2 X foundry	\$15.00 to \$15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25 to 14.50
Basic	14.50
Standard low phosphorus	20.00

Ferroalloys.—While inquiries aggregating some 4000 to 5000 tons are reported for Western shipment, no new business in ferromanganese has developed in this district. Local sellers adhere to the recent \$38.50, Baltimore, quotation, although it is reported that small lots of speculative ferro have been sold at prices under that figure. Fifty per cent. ferrosilicon is now quoted at \$62, delivered, but no business of importance is pending. Furnace ferrosilicon, 11 to 13 per cent., is quiet.

Billets.—The demand still drags, consumers placing orders for small lots and showing little interest in any material quantities for forward delivery. For delivery in this territory open hearth rolling billets are quoted at \$21.40 to \$22.40, according to quantity and specification, while ordinary forging billets are quoted at \$26.50 to \$27.50, delivered.

Plates.—Makers in this district are encouraged by inquiries coming from the shipyards. Several builders have recently received orders for steel barges as well as large vessels, while inquiries are pending for a further number. It is estimated that contracts for 6000 to 8000 tons will be given for ship plates in the near future. There is also considerable business in structural plates in sight. Open quotations for ordinary heavy steel plates have settled down to 1.40c. to 1.45c., delivered, dependent upon specifications and quantity.

Structural Material.—Several good-sized propositions are being figured on, but in quite a few instances uncertainty surrounds the final closing of contracts. Considerable business in boat shapes is under negotiation. Bids are in under revised estimates for the new municipal convention hall. In this instance the quantity of structural material required has been slightly increased, 12,400 tons being required under the new plans. Considerable uncertainty surrounds the placing of the contract and it is believed that the business will be held up. The Baldwin Locomotive Works has asked for bids for the structural work for an addition to its erecting shop at Eddystone, Pa., requiring about 5000 tons, but states that it is obtaining quotations for information and is not likely to go ahead with the project at this time, although the trade believes that if prices are low enough the company may be induced to go ahead with the work. Several buildings requiring from 100 to 300 tons have been contracted for by local fabricators, while a power house for the Lehigh Valley Railroad, requiring about 2000 tons, is being figured on. Some moderate bridge orders have been placed, while one requiring 6000 tons, for a New Jersey railroad, is being estimated on. Fabricators are again reporting

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easy prices and while 1.40c. is the minimum open quotation for plain shapes, delivered here, it is contended that that price is not particularly firm.

Sheets.—Eastern mills have been somewhat better fixed as far as orders are concerned and have been able to operate mills at close to full capacity this week. There is, however, little forward buying. Eastern makers obtain a material advance over the Pittsburgh basis, particularly for prompt shipment.

Bars.—While there does not appear to be a great deal of business moving, a number of the Eastern mills are somewhat better engaged. Orders, while small, aggregate a fair total. For current orders little difficulty in obtaining ruling quotations is reported, but the market has not been seriously tested for large lots, either for bar iron or steel bars, which for the ordinary run of business are quoted at 1.22½c. to 1.27½c. and 1.30c. to 1.35c., respectively, delivered in this territory.

Coke.—Occasional small lot sales comprise the bulk of the business. Few contracts are reported, and those made have been confined to the foundry grade, for which prices remain unchanged. Furnace coke is a trifle weaker, sales of prompt being reported at \$1.50 at oven. The following range of prices per net ton, delivered in this territory, about represents the market:

Connellsville, furnace coke.....	\$3.70 to \$3.90
Foundry coke	4.25 to 4.60
Mountain furnace coke	3.30 to 3.50
Foundry coke	3.85 to 4.20

Old Material.—Consumers continue to show practically no interest beyond taking on occasional bargain lots, and, for the most part, are out of the market. Railroad offerings are about the usual size and, from reports of dealers' offers, low prices will prevail. A little more interest on the part of some of the large consumers of borings is reported, but so far has not resulted in any business. Under the circumstances a narrower spread of quotations prevails in most grades, with prices largely based on forced sales and large quantities of material would not be available at current prices. The following range about represents quotations at which the ordinary current business for prompt shipment can be done, delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to \$1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap.....	\$12.00 to \$12.25
Old steel rails, rerolling (nominal).....	13.00 to 13.50
Low phosphorus heavy melting steel scrap.....	16.25 to 16.75
Old steel axles (nominal).....	18.00 to 18.50
Old iron axles (nominal).....	23.50 to 24.00
Old iron rails (nominal).....	16.50 to 17.00
Old car wheels.....	11.75 to 12.00
No. 1 railroad wrought.....	14.00 to 14.25
Wrought iron pipe.....	11.50 to 11.75
No. 1 forge fire.....	10.00 to 10.50
No. 2 light iron (nominal).....	6.00 to 6.50
Wrought turnings.....	8.00 to 8.25
Cast borings.....	7.50 to 7.75
Machinery cast.....	12.50 to 13.00
Railroad malleable (nominal).....	11.00 to 11.50
Grate bars, railroad.....	9.25 to 9.75
Stove plate.....	9.25 to 9.75

Matthew Addy & Co. have opened in connection with their Philadelphia office, 408, 409, 411 Real Estate Trust Company Building, a department for handling finished iron and steel products, which will be in charge of Lewis W. Lukens, for many years president and treasurer of the Longmead Iron Company.

Cincinnati

CINCINNATI, OHIO, October 11, 1911.—(By Telegraph.)

Pig Iron.—The market continues inactive. According to selling agencies it is practically impossible to interest consumers as the most of them have sufficient iron to tide them over until the first of the year, at which time they anticipate they will be able to cover requirements at practically the same figures as they can to-day. Consumers are taking contract shipments in a very satisfactory manner, indicating that the melt is being maintained. Order books have not been opened to any extent for next year's business, although it is intimated that several furnaces are willing to take a limited tonnage for this delivery. The situation is unchanged in the Ironton district and quotations appear to be fairly well established at \$13 for this year and \$13.50 for the first quarter of next. A consumer in Western territory secured 500 tons of Southern silicon, 2.25 per cent. and over, on the basis of \$10,

Birmingham, for this year's delivery. The local melter that was in the market last week for approximately 400 tons has secured the desired tonnage. A large consumer in Indiana is inquiring for 600 tons of Northern foundry grades for delivery covering the first quarter of next year and a southern Ohio melter wants 100 tons of high manganese for prompt delivery. Based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for prompt shipment:

Southern coke, No. 1 foundry and 1 soft.....	\$14.00 to \$14.25
Southern coke, No. 2 foundry and 2 soft.....	13.25 to 13.75
Southern coke, No. 3 foundry.....	12.75 to 13.25
Southern coke, No. 4 foundry.....	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio silvery, 8 per cent. silicon.....	16.95 to 17.20
Lake Superior coke, No. 1.....	14.70 to 14.95
Lake Superior coke, No. 2.....	14.20 to 14.45
Lake Superior coke, No. 3.....	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel.....	25.50 to 25.75
Lake Superior car wheel.....	19.00

(By Mail.)

Coke.—Foundry coke is in a little better demand, but new business continues to be confined to carload orders for immediate use. Producers in all three districts are keeping a close watch on the situation and the curtailment of production has enabled them lately to maintain prices on a steady level. We quote 48-hr. coke in the Connellsville field around \$1.50 to \$1.55 per net ton at oven, for prompt shipment, and from \$1.60 to \$1.70 in the Wise County and Pocahontas districts, with the usual 10c. to 25c. per ton added on future contracts.

Finished Material.—The market continues to show a somewhat unsettled condition and specifications are coming in slowly. The local structural demand is light and little is being figured on at present. Prices continue to fluctuate somewhat and reports indicate some shading on desirable business. The open quotation on steel bars is said to be fairly well maintained on a 1.15c., Pittsburgh, basis, with shapes quotable at 1.25c. and plates 1.20c., Pittsburgh.

Old Material.—Railroad offerings are said to be large and the demand for scrap of all kinds is of a limited character, although an exception may be made of borings and turnings. Prices are still weak, but it is not believed that they will go any lower unless there should be an unexpected softening of pig iron quotations. The approximate prices paid by buyers, delivered in their yards in southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton.....	\$10.00 to \$10.50
Casting borings, net ton.....	4.50 to 5.00
Steel turnings, net ton.....	5.50 to 6.00
No. 1 cast scrap, net ton.....	9.25 to 9.75
Burnt scrap, net ton.....	6.25 to 6.75
Old iron axles, net ton.....	16.25 to 16.75
Bundled sheet scrap, gross ton.....	7.25 to 8.25
Old iron rails, gross ton.....	13.25 to 13.75
Relaying rails, 50 lb. and up, gross ton.....	20.75 to 21.50
Old car wheels, gross ton.....	10.00 to 10.50
Heavy melting steel scrap, gross ton.....	9.75 to 10.25

Cleveland

CLEVELAND, OHIO, October 10, 1911.

Iron Ore.—Ore firms are cleaning up their shipments on contracts rapidly. The season of lake navigation will close early and there will be little ore brought down after November 1. Lake shipments from October 1 until the close of navigation will probably not be much over 5,000,000 tons. No sales or inquiries are reported. It is too late in the season now for the shippers to expect to make any further sales of any size. We quote prices as follows: Old range Bessemer, \$4.50; Mesaba Bessemer, \$4.25; old range non-Bessemer, \$3.70; Mesaba non-Bessemer, \$3.50.

Pig Iron.—With the exception of the sale of 1000 tons to a Cleveland foundry noted last week the lower prices quoted on Bessemer iron appear to have brought out no orders or inquiries. While Bessemer is quoted at \$14.65, Valley furnace, it is believed that an inquiry for a round tonnage might bring out a lower price. The local interest that bid \$12.50, Valley furnace, on a St. Louis inquiry for 2500 tons of basic, the freight rate from the Valley being \$3, did not get the contract. It is stated that there were three lower bidders and that the business went to the Chicago district at \$15.25, delivered. The demand for foundry grades continues light, sales being mostly in small lots to small consumers. A northern Ohio furnace manufacturer has

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purchased 1000 tons of No. 2 foundry. We also note the sale of 500 tons of Northern foundry and high silicon iron to an Ohio manufacturer of sanitary ware for the last quarter delivery. A local furnace has sold 200 tons of No. 2 foundry for northern Ohio shipment at \$13.50, at furnace. The Mansfield, Ohio, stove manufacturer, whose inquiry for 500 tons of No. 2 Northern iron was noted last week, has increased his inquiry to 800 or 1000 tons for delivery through the last quarter and first half. There is an inquiry from Barberton, Ohio, for 600 tons of malleable iron for the last quarter delivery. For Cleveland delivery we quote as follows for prompt shipment and for the last quarter:

Bessemer	\$15.55
Basic	13.40
Northern foundry, No. 2.....	13.75
Gray forge	13.00
Southern foundry, No. 2.....	\$14.35 to 14.85
Jackson Co. silvery, 8 per cent. silicon....	17.30 to 17.55

Coke.—The only demand is for small lots of foundry coke for prompt shipment. Prices are stationary and firm. We quote standard Connellsville furnace coke at \$1.50 to \$1.55 per net ton, at oven, for prompt shipment and \$1.60 to \$1.70 for contract. Connellsville 72-hr. foundry coke is held at \$1.85 to \$2.15 for prompt shipment and \$2.10 to \$2.40 for contract.

Finished Iron and Steel.—Mills are getting a fair volume of small orders. Further than bringing out a few good-sized stock orders, low prices have not resulted in much improvement in the demand. Consumers in most cases are buying only in small lots for their immediate requirements. The American Bridge Company has taken the contract for the Cleveland Leader Building, requiring about 4500 tons of steel. Competition was very keen and it is understood that the successful bidder quoted a price of about \$38 per ton, fabricated. The erection of this building will not be started until next summer. The price situation remains unsettled and there are frequent rumors of lower quotations than the generally recognized bottom prices. Steel bars are quoted at 1.15c., Pittsburgh, but this price can be shaded to 1.10c. and perhaps slightly lower for desirable lots. Mills are waiving the usual extra for twisting soft steel bars for reinforced concrete work, making the price close to that for hard steel bars, which are firm at 1.10c. Structural material is firm at 1.20c. to 1.25c., the lower price being quoted only for desirable specifications. Prices on plates are weak and irregular. While the general quotation is 1.20c. to 1.25c., sales are reported by Ohio mills at as low as 1.16c., Pittsburgh. The demand for sheets is light. The general quotation is 1.90c. for No. 28 black, and 2.90c. for No. 28 galvanized. The demand for rivets is not active. We quote structural rivets at 1.60c., Pittsburgh, and boiler rivets at 1.70c. The latter price, however, is being shaded \$1 a ton. We note the sale of a small tonnage of forging billets at \$25, Pittsburgh. The demand for iron bars is light. The Empire rolling mill, Cleveland, is still shut down. We quote iron bars at 1.20c., Cleveland, this price not being shaded.

Old Material.—The market is very weak, prices being from 25c. to 50c. a ton lower on several grades. Trade is almost at a standstill. While mills are not eager to buy, some would take on scrap at particularly attractive prices. Dealers and producers, however, will sell practically nothing at present quotations. Local mills are offering \$10.50 to \$11 for heavy steel scrap, but have been able to pick up only a few small lots at the higher price. There is very little demand for iron making scrap. We note the sale of 800 tons of cast scrap to a local foundry. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling.....	\$12.25 to \$12.50
Old iron rails.....	14.00 to 14.50
Steel car axles.....	17.00 to 17.50
Heavy melting steel.....	10.75 to 11.00
Old car wheels.....	11.25 to 11.50
Relaying rails, 50 lb. and over.....	22.50 to 23.50
Agricultural malleable.....	10.75 to 11.25
Railroad malleable.....	11.25 to 11.75
Light bundled sheet scrap.....	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles.....	\$18.50 to \$19.00
Cast borings.....	6.00 to 6.25
Iron and steel turnings and drillings.....	6.75 to 7.00
Steel axle turnings.....	7.50 to 8.00
No. 1 busheling.....	9.25 to 9.50
No. 1 railroad wrought.....	11.50 to 11.75
No. 1 cast.....	11.00 to 11.50
Stove plate.....	9.00 to 9.25
Bundled tin scrap.....	11.00 to 11.50

St. Louis

St. Louis, Mo., October 9, 1911.

The trade here seems to have settled down to the belief that there is a long, slow and hard pull ahead, and, while prices show no demoralization in any direction, nevertheless the tendency is toward the low range. Some sizable deals were closed the past week in pig iron and coke, but in finished products and scrap there was nothing doing aside from the usual hand to mouth business which has prevailed so long.

Pig Iron.—The inquiry for 2500 tons of basic iron reported last week developed later into a 6000-ton order, the buyer being the Commonwealth Steel Company. As nearly as can be learned here the contract is on a basis of about \$12.30, Valley, and the delivery is to extend over the first quarter of next year. Under an existing contract the Commonwealth company has 2000 tons per month still coming to it for the remainder of the current year. A note of improvement is the receipt of inquiries for delivery over the first quarter and first half of 1912, the largest in this line being one for 1000 tons of Southern which will probably go at about \$10 for No. 2 or analysis equivalent to No. 2, Birmingham basis. The ferrosilicon previously reported has not been placed.

Coke.—There has been some interest in the market due to the placing of a contract, distributed delivery, by the St. Joseph Lead Company for 20,000 tons of 48-hr. coke. It is understood that this went close to if not actually at \$1.50 per net ton at oven. Another smelter order for 3000 tons of 48-hr. coke was also placed.

Finished Iron and Steel.—The business of the week has been practically all on specifications for immediate use and the tonnage actually moved has shown somewhat of a decrease. Announcement is made of the completion of the financing of an interurban railroad connecting St. Joseph, Kansas City and Excelsior Springs, Mo., requiring about 7700 tons of rails, for which the order is expected to be placed shortly. Bars are quiet, with little demand for either the vehicle or the agricultural implement trade. Track fastenings have been in fair request at steady prices. Light rails have shown some demand from the coal mines and a little from the lumber roads, but no great total.

Old Material.—The market is almost at a standstill. The Missouri Pacific list went at fair prices, but these showed no increase in the quotations. The Wabash has out a list of 800 tons which will close on the 11th and the Southern one of 600 tons closing on the 12th. Dealers are taking advantage of the present condition of the market to buy against their sale contracts or to store for future business. Otherwise there is no feature to the local situation. Dealers' prices, per gross ton, f.o.b. St. Louis, show some changes, all slight reductions, as follows:

Old iron rails.....	\$12.00 to \$12.50
Old steel rails, rerolling.....	11.50 to 12.00
Old steel rails, less than 3 ft.....	10.50 to 11.00
Relaying rails, standard section, subject to inspection.....	22.50 to 23.00
Old car wheels.....	12.00 to 12.50
Heavy melting steel scrap.....	10.50 to 11.00
Frogs, switches and guards cut apart.....	10.50 to 11.00

The following prices are per net ton:

Iron fish plates.....	\$10.50 to \$11.00
Iron car axles.....	18.00 to 18.50
Steel car axles.....	16.00 to 16.50
No. 1 railroad wrought.....	10.25 to 10.75
No. 2 railroad wrought.....	9.25 to 9.75
Railway springs.....	9.25 to 9.75
Locomotive tires, smooth.....	13.00 to 13.50
No. 1 dealers' forge.....	7.00 to 7.50
Mixed borings.....	5.00 to 5.50
No. 1 busheling.....	8.50 to 9.00
No. 1 boilers cut to sheets and rings.....	7.00 to 7.50
No. 1 cast scrap.....	8.50 to 9.00
Stove plate and light cast scrap.....	7.00 to 7.50
Railroad malleable.....	7.50 to 8.00
Agricultural malleable.....	6.50 to 7.00
Pipes and flues.....	7.50 to 8.00
Railroad sheet and tank scrap.....	7.00 to 7.50
Railroad grate bars.....	6.50 to 7.00
Machine shop turnings.....	6.50 to 7.00

Birmingham

BIRMINGHAM, ALA., October 9, 1911.

Pig Iron.—Notwithstanding expectations to the contrary, stocks in this State were reduced some 15,000 tons in September, as is shown by actual figures returned October 1. The quantity now on hand consists of approximately 140,000 tons of free foundry iron, 61,000 tons of warrant iron, and 18,000 tons of free basic iron, with furnace operations the same on October 1 as on September 1. A comparison of order book requirement with the present accumulation, and the prob-

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able make during the remainder of the year, is not obtainable, but it is a fact that at least two of the large interests have very little iron to offer for shipment prior to January 1. The volume of business transacted the past week was considerably larger than in the week previous. The largest sale recently reported was a lot of 750 tons of No. 2 soft, for shipment within 90 days, at \$10.25, Birmingham. An aggregate of 700 tons of 2 to 2.50 per cent. silicon iron was sold at \$10 Birmingham, and 600 tons of a favorite brand in carloads and lots of 50 tons each, for comparatively early shipment, was sold at \$10.50 Birmingham. The sale of 500 tons of high manganese iron, with silicon above 3 per cent., is reported sold at a slight concession from \$12, and a smaller quantity of low silicon, high manganese iron was sold at \$11. An inquiry for 10,000 tons of No. 2 foundry and 4000 tons of lower grades, received during the week through Northern offices, has not resulted in a sale so far, owing to the difference between the price offered and producers' quotations. With this exception the business pending consists of comparatively small lots for early shipment, with but little interest manifested in deliveries after January 1. The price for the delivery just mentioned is still a matter of uncertainty, but a basis of \$10.50 would no doubt obtain with the majority of the producing interests for shipments over the first quarter, while a basis of \$10.25 is not considered improbable where the offerings are attractive.

Old Material.—Prices are considered 50 cents per ton lower for all grades, with the demand very light and of a rather unsatisfactory nature. The most encouraging feature in the situation is the comparatively small accumulation of stock on consumers' yards. Dealers' stocks show practically no increase during the month of September, and no additions are being made except where bargain lots are offered. We revise dealers' nominal asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles (light).....	\$12.50 to \$13.00
Old steel axles (light).....	11.50 to 12.00
Old iron rails.....	11.50 to 12.00
No. 1 railroad wrought.....	10.00 to 10.50
No. 2 railroad wrought.....	8.50 to 9.00
No. 1 country wrought.....	6.50 to 7.00
No. 2 country wrought.....	6.00 to 6.50
No. 1 machinery, cast.....	8.50 to 9.00
No. 1 steel.....	8.00 to 8.50
Tram car wheels.....	7.50 to 8.00
Standard car wheels.....	9.00 to 9.50
Light cast and stove plates.....	6.00 to 6.50

Cast Iron Pipe.—The movement from local plants was very heavy during the week and a fairly attractive tonnage, in small lots, was placed for municipal requirement. Mention is not made of additional large contracts for early placing, but the outlook generally is considered favorable. Prices are unchanged and we continue to quote as follows: 4 to 6-in., \$23; 8 to 12-in., \$22; over 12-in., average, \$21, with \$1 per ton extra for gas pipe. These prices are per net ton f.o.b. cars at Birmingham district plants, and are probably subject to shading for large municipal contracts.

The blowing in of the Alabama City furnace of the Southern Iron & Steel Company has been postponed by reason of additional repairs found necessary.

Repairs to the DeBardeleben plant of the Tennessee Coal, Iron & Railroad Company, Bessemer, Ala., are under way, but no announcement has been made as to the date when either stack at that plant will be blown in.

It is understood that the rehabilitation of the former Western Steel Car & Foundry Company's plant at Anniston, Ala., is under consideration, although no definite announcement has been made in that regard.

Buffalo

BUFFALO, N. Y., October 10, 1911.

Pig Iron.—A fair amount of inquiry has been received from New York, New England and New Jersey points, principally for 1911 delivery, most buyers being rather cautious about 1912 at the present time. The week has shown a little increase in buying by foundries supplying the railroad trade and also a slight increase in general lines. Orders placed include one of 1000 and one of 500 tons of malleable, taken at \$13.75 at furnace; 600 tons of No. 2 X at \$13.75; 2500 tons and 400 tons of No. 3 at \$13.25, all for this year's delivery. Melters are calling for prompt shipment, both on new orders and old contracts. Furnace B, of the Tonawanda Iron & Steel Company, went out of blast to-day and the entire plant is now shut down, furnace A hav-

ing gone out some months ago. The depression in the pig iron business, which has forced prices below the level of the company's cost of production, was the cause of the shut down. There are 10 of the 19 furnaces in the Buffalo district now out of blast. For delivery over the remainder of 1911 we quote as below, f.o.b. Buffalo. It is likely that these prices can be obtained for the first quarter of next year, although some furnaces are holding for a little higher level for 1912 delivery:

No. 1 X foundry.....	\$13.75 to \$14.25
No. 2 X foundry.....	13.50 to 14.00
No. 2 plain.....	13.25 to 13.50
No. 3 foundry.....	13.00 to 13.50
Gray forge.....	13.00 to 13.25
Malleable.....	13.75 to 14.25
Basic.....	13.75 to 14.25
Charcoal.....	16.50 to 17.25

Finished Iron and Steel.—Inquiries in most lines of finished products indicate the pursuance of the hand to mouth policy in meeting consumption requirements. Consumers do not seem to be willing to buy in any large quantities on the present unsettled market. Prices for bar products are ruling at 1.15c., Pittsburgh base. For shapes 1.25c. to 1.30c. is being quoted, according to the tonnage and delivery required. Plates are ruling at 1.25c. for the regular trade. Railroads are buying a little more freely both in material for car construction and for track supplies. It is understood that the Merchants' Despatch Transportation Company has been awarded a contract for 2000 cars by the New York Central. The Canadian Government is calling for tenders for rails and track supplies for the government road to Hudson Bay, for which 30,000 tons of rails and corresponding quantities of track supplies will be required. Canadian business in other lines of finished products, which was halted to some extent by the recent election, is again coming forward in good volume. The demand for black and galvanized sheets has been fairly active in the week, apparently stimulated by the low prices now obtainable. Fence wire is held firmly at 1.45c., base, and nails at \$1.65. In fabricated structural lines new inquiry has been rather slow in coming out this week, but a large number of new building projects are developing and will soon be ready for figuring. Bids will soon be received for steel for the new edifice for the First Church of Christ, Scientist, requiring 350 tons; also for the extension of the steel casting building of the Pratt & Letchworth Company plant, requiring a small tonnage of fabricated material. The Buffalo Structural Steel Company has received a contract for the addition to the Flint & Kent department store requiring about 350 tons.

Old Material.—The market continues stagnant, with no indications of new business developing in any line, although a fairly good demand is reported in outside districts. Shipments on contracts are being held up temporarily, consumers evidently having sufficient supplies on hand to cover their needs for the time. Prices are unchanged. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel.....	\$12.50 to \$13.00
Low phosphorus steel.....	16.00 to 16.50
No. 1 railroad wrought.....	14.00 to 14.50
No. 1 railroad and machinery cast scrap.....	13.50 to 14.00
Old steel axles.....	18.50 to 19.00
Old iron axles.....	22.00 to 22.50
Old car wheels.....	13.00 to 13.50
Railroad malleable.....	12.75 to 13.00
Boiler plate.....	12.50 to 13.00
Locomotive grate bars.....	11.00 to 11.50
Pipe.....	9.25 to 9.50
Wrought iron and cast steel turnings.....	7.15 to 7.40
Clean cast borings.....	7.00 to 7.25

The German Iron Market

BERLIN, September 28, 1911.

The good opinion as to the general state of trade remains unshaken, although iron shares are somewhat weaker on the stock markets. This was due partly to the less satisfactory reports from America. The Steel Works Union holds its regular monthly meeting tomorrow in Munich, and will have again to consider petitions for an increase of allotments. Several works are appealing for a 10 per cent. increase in the allotments in bars, plates and wire rods. It is reported that there is strong opposition to any increase; but, on the other hand, a dispatch of yesterday from Cologne states that there is now a very strong movement in favor of raising allotments at least in bars and plates, inasmuch as there is great activity in both lines. The demand for bars from the foreign market, it is added, continues strong and at rising prices; considerable foreign business for the first quarter of 1912 has already been

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done. The price latterly has risen from 99 to 100 marks f.o.b. Antwerp. The condition of the plate trade is equally satisfactory. The statistics of class B products for August, which were given out by the union yesterday, confirm this view of the activity in bars and plates. The month's shipments of the former reached with 318,482 tons, the highest figures ever registered, while plates also scored a record at 96,356 tons. The total shipments of these two classes, together with wire rods, tubes, castings, etc., amounted to 548,333 tons, which also makes a record. It exceeds the July movement by above 50,000 tons, and that of August, 1910, by nearly 55,000 tons.

The Pig Iron Syndicate has postponed the publication of its price list till the middle of October. It is semi-officially stated that hematite and other steel-making grades will be advanced 3 to 5 marks per ton. The syndicate has already begun to sell the low-grade Luxemburg iron at seaboard points, where it is regarded necessary to meet English competition. It was announced today that the Coal Syndicate has ordered a restriction in coke production to 60 per cent. of the allotments, after a restriction of 65 per cent. had been maintained for some time. It is not clear, however, whether this action foreshadows a curtailment in pig iron production. The action was explained by the managers as due in part to an increase in allotments that goes into effect October 1, and partly to the fact that some orders were not renewed.

In connection with the organization of the pig-iron combination it is interesting to note the views of one of the furnace companies, which is operated independently of steel works and coal mines—a class of concerns having had a hard struggle with the great mixed establishments for some years. The company in question is the Bergische Gruben und Hüttenverein of Hochdahl. It says in its annual report that the new syndicate must get a very heavy export trade in order to keep its members well employed; "heavy sacrifices must be made for this purpose and the booking prices for the individual furnaces will have to be so low as to leave them but a narrow margin of profit, provided the Coal Syndicate adheres to its high coke prices."

The Aumetz-Friede Company, of Lorraine, which has become a very important concern within a few years, has just announced a dividend of 12 per cent., against 10 last year and 7 for 1908-09. The great Gelsenkirchen Company announces an increase in its capital of 24,000,000 marks, which brings it up to 180,000,000 marks. It will then stand with Krupps as the two strongest iron and coal companies in Germany. Its last previous addition to its capital was in the spring of 1909, when 26,000,000 marks was raised.

The news from the Belgian market this week indicates that prices, which had been about stationary for several weeks, have again begun to rise. An advance of basic iron by 1.50 francs was reported several days ago, then a further rise of bars for export by 1 shilling f.o.b. Antwerp, occurred; and now a Brussels dispatch of today states that heavy plates have risen from 118 to 119 shillings, plates of ½-in. thickness from 123 to 124 shillings, and medium and finer qualities from 124-127 to 126-129 shillings f.o.b. Antwerp.

Boston

BOSTON, MASS., October 10, 1911.

Old Material.—The only change in the scrap metal market is a slight reduction in the prices of old steel axles, old iron axles and wrought turnings. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of \$2.30 a ton is included. Mill prices are approximately 50 cents a ton more than dealers' prices.

Heavy melting steel.....	\$9.50 to \$10.00
Low phosphorus steel.....	11.45 to 11.95
Old steel axles.....	14.00 to 14.50
Old iron axles.....	17.00 to 18.00
Mixed shafting.....	12.75 to 13.25
No. 1 wrought and soft steel.....	11.00 to 11.25
Wrought iron pipe.....	8.75 to 9.00
Skeleton (bundled).....	7.00 to 7.50
Cotton ties.....	7.00 to 7.50
No. 2 light.....	4.50 to 5.00
Wrought turnings.....	5.00 to 5.50
Cast borings.....	4.50 to 5.00
Machinery, cast.....	12.50 to 13.00
Malleable.....	9.25 to 9.75
Grate bars.....	6.00 to 6.50
Stove plate.....	8.00 to 8.50

New York

NEW YORK, October 11, 1911.

Pig Iron.—Pipe iron has made up the bulk of the transactions of the past week. One large interest has bought from 25,000 to 30,000 tons of iron, which is divided among Northern and Southern furnaces. Another buyer took several thousand tons for delivery on the Delaware River. In another case an eastern Pennsylvania pipe foundry has been in the market for a round lot, but the amount purchased is not known. There has been a fair run of business in foundry iron, including two or three lots of 1000 tons each and several of 500 tons, the most of it for delivery in the first quarter of 1912. Prices are no firmer and the present basis for this year's delivery is applying more and more to the early months of next year. The impression made among buyers by recent additions to the list of active merchant furnaces is that the supply of iron will be ample and that prices are likely to be little changed in the next two months. Virginia furnaces continue to sell at \$12.25 for No. 2 X for this year, with 25c. advance asked for first quarter. Buffalo sales for first quarter have been made at \$13.50 at furnace. It should be mentioned that there are some offsets to the furnaces blowing in. For example, while one Virginia furnace was blown in in September, another stack of the same company was scheduled to blow out early in October. In the Buffalo district the second Niagara furnace was blown out last week, which offsets one Wickwire, scheduled to resume after relining. In eastern Pennsylvania two furnaces are about to be blown in, while one Warwick and one Brooke will probably go out. Stocks of pig iron at furnaces reporting to the Eastern Pig Iron Association declined considerably in September, and there was a reduction also in the stocks at Virginia furnaces. We quote Northern iron at tidewater as follows: No. 1 foundry, \$15.25 to \$15.50; No. 2 X, \$15 to \$15.25; No. 2 plain, \$14.50 to \$14.75. Southern iron is quoted at \$15 to \$15.25 for No. 1 foundry and at \$14.50 to \$14.75 for No. 2.

Finished Iron and Steel.—Nothing sensational has developed in the finished iron and steel market, prices remaining at low level and the volume of business, of generally small orders, aggregating about the same as it has for the last few weeks. Many of the sellers maintain that both plates and plain structural material are held at the 1.30 Pittsburgh basis with plates going at an average, perhaps, of 1.27½. Plate mills are thought to be running generally at about 50 to 55 per cent. capacity. In the structural field the largest new project is the Hyde Building, 20 stories, at Twenty-fifth street and Madison avenue, involving 4900 tons of steel work. Bids are probably now all in on the 22,000-ton building to replace the Madison Square Garden. The lowest bidder for the 6000 to 8000 tons required for the two long bridges of the Central Railroad of New Jersey is understood to be the American Bridge Company. Marc Eidlitz & Son are general contractors for the 1200-ton Y. W. C. A. Building at Fifty-second street and Lexington avenue. Among structural contract awards may be mentioned: The McDonald Building, Amsterdam avenue, 800 tons, to the American Bridge Company; two bridges at Northville, N. H., for the Boston & Maine, 100 tons, to L. F. Shoemaker & Co.; a stock house for Peter Doelger, 800 tons, a large part of which is cast iron columns, to the Hinkle Iron Company. The Lackawanna Steel Company is to furnish the 5000 tons for the Filene Building, Boston. The Belmont Iron Works is to supply the 650 tons for the Barge office in New York and not the company reported last week. Quotations remain: Plain structural material, 1.41c. to 1.46c.; plates, 1.36c. to 1.41c.; steel bars, 1.31c. to 1.36c.; bar iron, 1.26c. to 1.31c., all New York. Plain material and plates from store, New York, 1.70c. to 1.80c.

Cast Iron Pipe.—It is understood that a Virginia pipe foundry has secured the contract for 8900 tons of 40-in. pipe to be furnished to the New York Board of Water Supply. The price obtained was probably a little above \$20, delivered. No public lettings of importance are announced. Business in small lots is fairly active, as those who have pipe laying to do this fall are hurrying it along before the advent of cold weather. Carload lots of 6-in. are quoted at \$21 to \$22 per net ton, New York.

Old Material.—About the only transactions are sacrifice sales. Material on track which has to be moved is sold at the best price obtainable, irrespective

THE IRON AND METAL MARKETS

of market quotations. The outlook for heavy melting steel scrap is exceedingly discouraging, as the leading steel works in eastern Pennsylvania are buying practically nothing, some of them stating that they are sufficiently supplied either with stock on hand or material under contract to cover their needs for at least the remainder of the year. The rolling mills making bar iron appear to be doing nothing in the scrap market, evidently being well covered for their immediate wants and probably for some time ahead. The foundries are buying cast scrap but sparingly, notwithstanding the fact that its price is so much under that of pig iron. Dealers' prices, per gross ton, New York and vicinity, are about as follows:

Old girder and T rails for melting.....	\$9.50 to \$10.00
Heavy melting steel scrap.....	9.50 to 10.00
Relaying rails.....	20.00 to 21.00
Rerolling rails.....	11.50 to 12.00
Iron car axles.....	20.00 to 20.50
Old steel car axles.....	15.00 to 15.50
No. 1 railroad wrought.....	11.75 to 12.00
Wrought iron track scrap.....	10.75 to 11.00
No. 1 yard wrought, long.....	10.50 to 11.00
No. 1 yard wrought, short.....	9.50 to 10.00
Light iron.....	4.00 to 4.50
Cast borings.....	3.00 to 3.50
Wrought turnings.....	3.50 to 6.00
Wrought pipe.....	9.00 to 9.50
Old car wheels.....	10.00 to 10.50
No. 1 heavy cast, broken up.....	10.00 to 10.50
Stove plate.....	8.00 to 8.50
Locomotive grate bars.....	8.00 to 8.50
Malleable cast.....	10.00 to 10.50

Ferroalloys.—There are rumors of sales of ferromanganese at \$37.50, but these are believed to be for small spot lots. For delivery over the remainder of the year the usual quotation here is \$38.50, Baltimore. Some sales of carload lots of ferrosilicon have been made this week at \$60, Pittsburgh, and several inquiries for delivery over the remainder of the year are out. New York sellers are firm in the belief that ferrosilicon will go higher and are now asking \$62, Pittsburgh, for the remainder of the year and are reluctant to quote figures for next year's delivery.

Metal Market

NEW YORK, October 11, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.									
Copper, New York.		Electrolytic, New York.		Tin, New York.		Lead, New York.		Spelter, New York.	
Oct.	Lake.	lytic.	New York.	New York.	St. Louis.	New York.	St. Louis.	New York.	St. Louis.
5.....	12.50	12.25	40.10	4.47½	4.32½	6.00	5.85		
6.....	12.50	12.25	40.25	4.35	4.20	6.05	5.90		
7.....	12.50	12.25	.....	4.35	4.20	6.10	5.95		
9.....	12.50	12.25	41.50	4.25	4.10	6.15	6.00		
10.....	12.50	12.25	41.25	4.25	4.10	6.15	6.00		
11.....	12.50	12.25	41.25	4.25	4.10	6.15	6.00		

Spot tin is scarce and has advanced. Copper is unchanged. Lead is down. Spelter has advanced.

Copper.—The report of the Copper Producers' Association seems to have had little effect on the copper situation. From all accounts there is a good consumption of copper just now and consumers are buying steadily. Recent attempts to advance the market on Lake copper met with little success as many sellers seem to be satisfied to take 12.50c. Electrolytic continues to be held at 12.25c. In London this morning spot copper was sold for £54 6s. 3d. and futures at £55 3s. 6d. The market was dull. The exports of copper so far this month have not been heavy, amounting in all to 5073 tons.

Waterbury Average.—Through an unfortunate error the Waterbury average for September was misstated in *The Iron Age* of last week. The average was 12.62½c.

Pig Tin.—Spot tin is scarce, and although there is no attempt to corner the immediate supply in this country, prices have advanced on the strength of a good demand. The London syndicate has entered the list again and heavy purchases of futures were made in that market during the week. Consumers in this country seem to be fairly well supplied with tin for their immediate needs and consequently the demand is light. This morning pig tin was sold for 41.25c. and the offerings at that price were few. In London to-day spot tin was sold for £188 5s. and futures for £187. The arrivals of tin in this country so far this month have been 975 tons, and 1,172 tons are afloat.

Tin Plates.—The domestic demand for tin plates is quiet but the export market continues especially good. The market in foreign tin plates is unchanged and the price at Swansea, Wales, remains at 13s. 7½d.

The usual quotation here for 100-lb. coke plates is \$3.84, but it is understood that some concession is being made on this price.

Lead.—Two sharp reductions were made in lead in the New York market within a week. The cuts were made by the principal producer to meet reductions made by others. On Wednesday it reduced its price from 4.50c. to 4.35c. and on Monday a further reduction of 10 points was made. As a result that interest is again taking considerable business which would have gone to outside sellers who have not as yet met its price of 4.25c., New York. The market in St. Louis is now 4.15c.

Spelter.—The spelter market is very firm and has advanced during the week to 6.15c., New York. The advance was influenced in a measure by the good buying movement. It appeared early in the week that a number of consumers were short of stock as they came in and bought freely on a rising market. The St. Louis market is very firm at 6c.

Antimony.—Antimony continues dull and very weak. Cookson's has been reduced to around 8.15c., but buyers do not seem to want to take hold. Hall's is offered at 7.65c. to 7.70c., and Chinese and Hungarian grades are selling from 7c. up.

Old Metals, New York.—Dealers report business dull, with selling prices nominally unchanged, as follows, buying prices having been given in error last week:

	Cents per lb.
Copper, heavy and crucible.....	11.75 to 12.00
Copper, heavy and wire.....	11.37½ to 11.50
Copper, light and bottoms.....	10.50 to 10.75
Brass, heavy.....	8.00 to 8.25
Brass, light.....	6.50 to 6.75
Heavy machine composition.....	10.25 to 10.50
Clean brass turnings.....	7.75 to 8.00
Composition turnings.....	8.50 to 9.00
Lead, heavy.....	4.15
Lead, tea.....	3.90
Zinc, scrap.....	4.50

Chicago

OCTOBER 10.—A somewhat improved tone, was noted in the local metal market during the week, in connection with which will be active buying. Prices have remained practically unchanged, with the exception of a slight increase in casting copper and a decrease in the price of tin. We quote at Chicago: Casting copper, 12.37½; Lake, 12.62½c., in carloads, for prompt shipment; small lots, ¼c. to ¾c. higher; pig tin, carloads, 41.50c.; small lots, 43.50c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.95c. to 6c.; Cookson's antimony, 9¼c., and other grades, 8¼c. to 8¾c., in small lots; sheet zinc is \$8, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10½c.; copper bottoms, 9¼c.; copper clips, 10¼c.; red brass, 9¼c.; yellow brass, 7¼c.; lead pipe, 7¼c.; zinc, 4c.; pewter, No. 1, 26c.; tinfoil, 32c.; block tin pipe, 36c.

St. Louis

OCTOBER 9.—Lead shows a weakening tendency, while spelter is on the up grade. For the former the quotation is 4.20c., and for the latter the figure is 6c., with a good demand. Tin is decisively higher at 40.65c. Lake copper is quoted at 12.80c. and electrolytic at 12.72½c. Cookson's antimony is held at 8.47½c. In the Joplin market zinc sulphide is quotable at \$47 per ton for the top, while the assay basis for the past week for 60 per cent. metallic content ranged from \$44 down to \$40 per ton. In calamine prices are relatively much stronger than for the blend, the price the past week being \$32 per ton for choice lots. The assay basis price ranged from \$23 to \$25 per ton. Lead ore is weaker at \$56 to \$59 per ton. Scrap metal prices are: Light brass, 4c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3¼c.; pewter, 20c.; tinfoil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, October 11, 1911.

The stock market on the whole has been fairly steady. The chief incident of note was a sharp decline in Allis-Chalmers stocks and bonds. The common stock fell from 6 to 2, the preferred from 16½ to 10¾ and the bonds from 66¼ to 58. The sharp decline has brought out a statement from Vice-President Nichols, who says that while the volume of new business with the Allis-Chalmers Company has been unsatisfactory it has cur-

rent assets greatly in excess of its current liabilities. The company's product consists of heavy machinery, power plants, etc., and as new enterprises are now being held in abeyance a market must be found among going concerns who themselves are now operating far below capacity with consequently little incentive or courage to increase their capital expenditures. Securities of equipment companies have been well held, Car & Foundry common showing a somewhat significant advance. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com....	2 - 6	Pressed Steel, pref..	95 - 95½
Allis-Chalm., pref...	12½ - 16½	Railway Spring, com.	27½ - 27½
Beth. Steel, pref....	55½ - 57½	Republic, com.....	22½
Can, com.....	9½ - 10½	Republic, pref.....	83 - 84
Can, pref.....	82½ - 85½	Sloss, com.....	37 - 38
Car & Fdry, com....	45½ - 48	Pipe, com.....	11½ - 11½
Car & Fdry, pref.....	114	Pipe, pref.....	43½
Steel Foundries.....	30 - 33	U. S. Steel, com....	57½ - 60½
Colorado Fuel.....	27	U. S. Steel, pref....	108½ - 109½
General Electric....	147 - 150	Westinghouse Elec.	61½ - 62½
Gr. N. Ore Cert....	46½ - 49½	Am. Ship, com.....	49 - 50
Int. Harvester, com.	102 - 104½	Chic. Pneu. Tool....	45½ - 46
Int. Pump, com....	25½ - 28	Cambria Steel.....	43 - 43½
Int. Pump, pref....	80 - 81½	Lake Sup. Corp....	22½ - 25
Locomotive, com....	34½ - 35½	Warwick	10
Locomotive, pref.....	105	Crucible Steel, com..	10½ - 10½
Nat. En. & St., com....	15	Crucible Steel, pref.	75½ - 76½
Nat. En. & St., pref.	92 - 93	Harb. Wk. Ref., pref.	89
Pressed Steel, com..	28½ - 29		

A New York banking house has underwritten \$3,500,000 first mortgage 20-year 5 per cent. purchase money bonds of the Railway Steel Spring Company. The new bonds, which are dated October 1, 1911, are to cover the cost of the Interocean Steel Company's plant at Chicago. They are subject to redemption at 105 and accrued interest and a sinking fund of \$125,000 has been provided to start in 1914 to buy them in.

Dividends Declared

The corporation of J. G. White & Co., regular quarterly, 1½ per cent. on the preferred stock, payable November 1.

The Pittsburgh Coal Company, regular quarterly, 1¼ per cent. on the preferred stock, payable October 25.

The Harbison-Walker Refractories Company, regular quarterly, 1½ per cent. on the preferred stock, payable October 20.

The American Nut & Bolt Fastener Company, Pittsburgh, regular quarterly, 2 per cent.

The Standard Underground Cable Company, Pittsburgh, regular quarterly, 3 per cent.

Sunshine in California

It is encouraging, says the Bache Review, issued by J. S. Bache & Co., bankers, New York, to receive from the Pacific coast evidences that material well-being is prevalent there. The monthly financial letter of the American National Bank of San Francisco details a condition of prosperity in California and the adjoining States of the Pacific coast and facts in support of this are tabulated from the crop records, price quotations of leading products, gains in bank deposits and clearings, in traffic reports and in building construction figures. Gains over a year ago in capital and surplus, in individual deposits and in loans of the banks throughout the State are marked. Bank clearings for the eight months of 1911 show percentage in gains in all the leading cities of the State. The letter asserts that the sane optimism of the Pacific population is tempered only by apprehension as to what may develop in the East or in Europe.

An illustration of the prevailing thrift is pointed to in the record of the opening day at the Postal Savings Bank in San Francisco. The total first day's deposits were \$8,645, more than double the amount received at Chicago on the first day and about four times the Boston record. This is considered remarkable from the fact that San Francisco is well provided with regularly established savings banks, some of them dating back more than 50 years and having combined deposits of more than \$160,000,000. California's principal grain crop, barley, while not large, is of such exceptionally fine quality that prices have risen to unexpected levels. Hops, sugar, beets, walnuts and olives will all make big crops. The citrus fruit shipments for the year have been 40 per cent. higher than last year. The prune crop is estimated at 140,000,000 lb. against 80,000,000 lb. last year, with prices ranging higher. Raisins yield 100,000,000 lb. against 125,000,000 lb. last year, but prices are up fully 20 per cent., so that monetary returns will be about the same.

An event of national importance will be the formal commencement of work on the Panama Exposition on October 14, when President Taft will be in San Francisco, the terminus of his long tour, and will break ground for the first construction work of the exposition buildings. New steamship lines are being organized to take care of the great traffic between Pacific and Atlantic ports and it is said that five great European steamship companies are planning to establish regular sailings between San Francisco and their home ports. The outlook is for wonderful growth throughout the Pacific country.

A Move to Reduce British Steel Imports

A step has been taken in the British steel trade which is designed to reduce the amount of structural steel imported into Great Britain. The Scottish Steel-Makers' Association recently sent a circular to shipbuilders, bridge-builders and other consumers of plates and shapes announcing that the association would pay them a rebate of 5 shillings a ton on all steel bought and received by them after July 1, 1911, which had been manufactured at any of the mills of the associated steelmakers, whether such steel had been bought direct from the mills or otherwise. It was stated that the rebate would be computed for twelve months and be payable six months afterward, "but only to those consumers who have up to that date and since confined their purchases and use of steel (the class or classes manufactured by the associated makers) to that manufactured by such associated makers." While the plan originated with the Scottish branch of the industry, it could not be made effective without the co-operation of the English steelmakers, consequently a conference was held in London last week at which the North East of England Steel Makers' Association was represented. No details of the action taken at this meeting are available beyond the statement that the English manufacturers are in general in sympathy with the proposal, though they desired some modification in the details at first submitted by the Scottish steelmakers.

A statement compiled by the London Iron and Coal Trades Review shows that the imports of bars, angles, shapes and plates into Great Britain in the first eight months of 1911 were 152,695 tons, against 93,519 tons in the corresponding period of 1910. The British manufacturers had some reason, therefore, for concern over the growing use of foreign steel. As might be anticipated consumers are not altogether pleased with the new proposal. British shipbuilders consider that any restriction on their opportunity to secure low priced steel would interfere with their ability to compete in the shipbuilding trade. The question is raised also whether, after the new arrangement becomes effective, prices might not be advanced more than enough to counterbalance the 5 shillings rebate offered by the manufacturers to those buying their products exclusively.

The F. B. Shuster Company, New Haven, Conn., learns that the impression is now being conveyed in some quarters that it is to go out of business by reason of the death of President F. B. Shuster last August. Any report to that effect is incorrect, as the business will be continued on the same lines and under practically the same management as before. The question of selling out or closing up the business has never been considered. In spite of the general depression throughout the summer, the company has continued to run its plant full time, with a full force of men, and has turned out some very large orders. It now has a large amount of business on hand, in its regular lines of automatic wire straighteners and cutters and rotary riveting machines and in its special lines, with bright prospects for a good business through the fall and winter.

The new ore boat, J. M. Schoonmaker, named in honor of the vice-president of the Pittsburgh & Lake Erie Railroad, and built for the Shenango Furnace Company, Pittsburgh, was launched at the Ecorse yard of the Great Lakes Engineering Works, Detroit, Mich., October 8. This is the largest ore boat on the Lakes, and when the new lock gates at the Soo are completed it is expected to carry 15,000 tons or more. The length of the boat between perpendiculars is 617 ft., breadth of beam, 64 ft. and molded depth of hold 33 ft.

Personal

Harold S. Buttenheim, for the last two years manager of Iron Age-Hardware, has resigned as secretary and director of the David Williams Company. With his brother, Edgar J. (formerly circulation manager of the David Williams Company), Mr. Buttenheim purchased, recently, The American City, a monthly journal devoted to municipal problems and civic betterment, and published at 93 Nassau street, New York. This is a field of work in which Mr. Buttenheim has felt a deep interest for years. It is his belief that a journal devoted to the good government of cities, and the work of boards of trade and civic associations, can be made a substantial success. It will be his aim to make The American City such a paper, and for his success in this undertaking he has the best wishes of his former associates. Mr. Buttenheim's place as manager of Iron Age-Hardware will be taken by Roy F. Soule, already well known to the hardware fraternity.

Richard W. McKay has been appointed superintendent of blast furnaces of the Pennsylvania Steel Company at Steelton, Pa., succeeding John Reese, who resigned.

E. N. Zern, formerly with the H. C. Frick Coke Company and Jamison Coal & Coke Company, Pittsburgh, has been appointed assistant professor of coal mining in the University of Pittsburgh.

Frank Cunningham, for several years superintendent of the Mahoning Works of the Republic Iron & Steel Company at Youngstown, Ohio, has been appointed superintendent of the company's new tube mills. He is succeeded at the Mahoning Works by H. Steindreder, formerly of the company's works at Chicago. Mr. Cunningham was presented with a cut glass punch bowl, a silver tea service and gold watch and charm by officials and employees of the Mahoning Works.

J. L. Brierton, assistant to the vice-president of the Central Iron & Coal Company, Holt, Ala., has resigned.

W. C. McKee, formerly in the blast furnace department of the Algoma Steel Company, Sault Ste. Marie, Ont., has been appointed assistant superintendent in the blast furnace department of the Inland Steel Company, Indiana Harbor Ind.

Raymond Lewis, formerly superintendent of blast furnaces at Sault Ste. Marie, Ont., sailed for India October 3 to take the position of assistant superintendent of blast furnaces of the Tata Iron & Steel Company. R. H. Sanborn, formerly of the "Soó" plant, goes with him as foreman.

E. Steytler, who for some years has been assistant general manager of sales of the Pittsburgh Steel Company, has been appointed general manager of sales, succeeding F. H. Forman, who, owing to ill health and the necessity for a change of climate, requested to be released from the duties of the position. Mr. Forman will be located in Los Angeles, Cal., assuming there entire charge of the business of the same company on the Pacific coast.

Halsted Little, for many years associated with the sales department of Manning, Maxwell & Moore, has been appointed Eastern sales agent for the Detroit Twist Drill Company, with office at 30 Church street, room 604, New York City.

George Ritchie, the new works manager of Bolckow, Vaughan & Co., Middlesbrough, England, arrived in New York in the past week and will visit the important steel-making districts in the United States and Canada.

Felix A. Vogel, general manager Florence Iron Company, of Wisconsin, miner of iron ore, has returned from Europe after an absence of four months.

C. E. Pettee, who has been connected with the Herman Pneumatic Machine Company, Zelenople, Pa., for the past three years as works manager and salesman, resigned October 1.

B. S. Harrison, of London, representing Sota & Aznar, dealers in Spanish iron ore, who has been in this country on business for several weeks, sailed for England October 10.

Harry E. Zaring, assistant secretary of the Crucible Steel Company of America, Pittsburgh, has been elected secretary of the Crucible Coal Company, one of the subsidiary companies of the Crucible Steel Company, and will

assist J. C. Neff, general manager of the Coal Company, in connection with the development and operation of the property near Rice's Landing, Greene County, Pa. Mr. Zaring's headquarters will be in the Empire Building, Pittsburgh. P. C. Williams, formerly assistant secretary of the Pittsburgh Chamber of Commerce, has been elected assistant secretary of the Crucible Steel Company of America, to take the place of Mr. Zaring.

W. P. Snyder, president of the Shenango Furnace Company, Pittsburgh, has returned from a two months' trip to Europe.

E. W. Pargny, president of the American Sheet & Tin Plate Company, Pittsburgh, has returned from Europe.

Edward Worcester, vice-president of the National Tube Company, has returned to Pittsburgh from a business trip to California.

George L. Brown, treasurer of the Marshall Foundry Company, Pittsburgh, has gone to California for the winter.

W. H. Woufor, advertising and export manager of the William Powell Company, Cincinnati, Ohio, is on a business visit to Cuba.

C. L. F. Robinson, president of the Colt's Patent Firearms Mfg. Company, Hartford, Conn., is in England on a two months' business trip.

The Southern Iron & Steel Reorganization

Plans have been completed for the reorganization of the Southern Iron & Steel Company and its consolidation with the Alabama Consolidated Coal & Iron Company. A new company will acquire the properties of these companies, subject to about \$2,000,000 of underlying bonds on each property. For this purpose and for raising \$4,130,000 additional cash capital the new company will issue \$5,000,000 6 per cent. bonds, \$12,000,000 6 per cent. cumulative preferred stock and \$12,500,000 common stock, or \$30,000,000 new securities in all.

These new securities will be distributed on the following basis: Holders of the first refunding bonds of the Southern Iron & Steel Company will receive 80 per cent. in new preferred stock and 20 per cent. in new common stock; debenture holders, 60 per cent. in new preferred stock and 40 per cent. in new common stock; one year note holders, 100 per cent. in new bonds, 25 per cent. in new preferred stock and 100 per cent. in new common stock; preferred stockholders, 20 per cent. in new common stock, and common stockholders 5 per cent. in new common stock. Preferred stockholders of the Alabama Consolidated Coal & Iron Company will receive 150 per cent. in new preferred stock; common stockholders 122 per cent. in new preferred and 115 per cent. in new common stock.

There will be offered for subscription, for the aggregate sum of \$4,130,000 in cash, \$4,130,000 new bonds, \$1,032,500 new preferred stock and \$4,130,000 new common stock. Of this amount the allotment to the Southern Company's preferred stockholders is \$1,180,000 and the common stockholders \$950,000. The common stockholders of the Alabama Company may subscribe for the remaining \$2,000,000 of the merged company's bonds.

The depositary will be the Bankers' Trust Company of New York, and it is expected that a voting trust for the new securities will be formed.

September Copper Production and Stocks

The Copper Producers' Association has issued its statement for the month of September, as follows:

	Pounds
Stock of marketable copper of all kinds on hand at all points in the United States, September 1.....	133,441,501
Production of marketable copper in the United States from all domestic and foreign sources during September.....	115,588,950
Deliveries of marketable copper during September:	
For domestic consumption.....	\$7,311,584
For export.....	\$0,824,011
Total.....	106,135,595
Stock of marketable copper of all kinds on hand at all points in the United States, October 1.....	140,894,856

An increase in stocks of 7,453,355 lb. is thus shown. This is due to a heavy decline in exports in September, attributed to the unsettlement of business in Germany, caused by the dispute with France relative to Morocco.

The National Machine Tool Builders

The Annual Convention Largely Attended—A Group of Interesting Papers

The National Machine Tool Builders' Association held its annual meeting at Hotel Astor, New York City, October 11 and 12, with the largest attendance in its history, due partly to an increased membership, which has practically doubled in two years, and partly to the constantly growing interest in the work. The convention of the National Supply and Machinery Dealers' Association progressing simultaneously and to an extent jointly under the same roof had an important influence on the occasion. Tuesday night Machinery had its "inning" in the ball room of the hotel, with an elaborate vaudeville show and other entertainment, while Wednesday night the American Machinist gave a large theater party.

A feature of the convention was the "heart to heart talks" on trade conditions, in executive session, where manufacturers and dealers expressed their views.

The convention opened Tuesday morning with the largest attendance for the first day in the history of the organization. President Fred A. Geier was in the chair. After some preliminary routine business the officers made brief reports, that of Treasurer A. E. Newton showing the financial condition to be exceedingly prosperous. In the course of his remarks, Secretary Charles E. Hildreth read a characteristic communication from Charles L. Hilker, Hamilton Machine Tool Company, Hamilton, Ohio, entitled the "Spirit of Optimism and its Effect Upon Trade." In simple idiom Mr. Hilker struck at a present day tendency to exaggerate the more unsatisfactory of business conditions. He said:

Optimism and Its Effect on Trade

The other day Smith got on the street car. He was a little manufacturer, but was feeling pretty well satisfied with the way things were going and had decided upon adding two or three new tools to his equipment. At the next corner on got Jones, the big manufacturer. "Oh, hello; good morning, Mr. Jones," said the erstwhile cheerful and optimistic Mr. Smith. "How's business?"

"Nothing doing at all," answered Jones, pulling a long face and feeling at his chin. "Never saw business any worse; don't seem like it ever would pick up either. I don't see what we are going to do if things keep on this way."

Smith's optimism first became pale and then took on deeper tints of indigo. By the time he had reached his shop commercial shivers were chasing themselves up and down his spine and he was ruminating. "If a big man like Jones is worrying about the future and thinks things are all going to pot, it's time for me to take another think. I need those tools and could use them, too, but if there isn't going to be any business, why—"

Smith didn't buy any new equipment, and Jones lost just the amount of business that Smith's little optimistic push would have started down the line. Now, there are a whole lot of cheerful little Smiths and a whole lot of pessimistic big Joneses. And which policy works out the best? The old quotation, "laugh and the world laughs with you," is dead wrong in comparative value with the weep end of it when it comes to studying the business pulse. One little lament from the big Joneses is going to scare more confidence out of the little Smiths than you can squeeze back in a year. They draw back in their shells like so many turtles and wait "to be shown" before so much as sticking out a nose.

Now you, Mr. Big Manufacturer, may not be having things all your own way. You increased your plant and put in new machinery to meet an inflated demand. Perhaps there is an overhead expense of power, belting and pulleys that are not productive. Perhaps even some of the banks become peevish occasionally. But—

Is this an excuse for telling some one else?

Do you gain anything by scaring all the commercial confidence out of the little man who wanted to give you an order and was only cautious enough to feel you out before doing so?

Does it get you anything to talk to the general public as though you were in the last stages of dyspepsia and trying to get an extension on your paper from an obdurate banker? You know it does not. What do we care if Wall Street is suffering from an in-growing grouch?

What difference does it make to us if the railroads prefer utilizing their scrap-pile machinery? Or, if the

steamship purchasing agents give you the impression of a group of pall-bearers? Their orders count, of course, but they are far from being the only grain in the sand pile. And it is our foolish lamentations over the procrastination of these sometime big buyers that causes us to spill the ice water down the collar of the cheerful and hopeful little man.

It's the little things that count in life—the little men whose cheerful optimism makes them bigger men to-morrow and real personages to be reckoned with the day after, that we have to take into consideration. And if by handing out the glad hand of present and future prosperity we can foster and encourage this growth, we can, so far as railroads, Wall Street and Congress are concerned, trot blithely on our way.

So what's the use of rehearsing, "just before 1907 we were doing etc., etc." That's ancient history and there's no use in going into post-mortems. We've got to live now.

The new constitution committee, A. E. Tuechter, chairman, was excused from further service with a vote of thanks.

The first paper was that of Henry L. Gantt, consulting engineer, New York, on "Task Work as a Basis of Proper Management." He discussed the premium and bonus systems in very great detail, going deep into the elemental work which must be done in every shop in the establishment of this method of wages. The paper was listened to with great interest and was followed by a spirited discussion, among those participating being William Lodge, E. P. Bullard, Jr., Carl G. Barth, each of whom gave valuable information as to certain phases of the system in his own works.

New Members

New members were elected as follows:

Watson-Stillman Company, New York City.
Beaudry & Co., Inc., Boston, Mass.
Lennox Machine Company, Chicago, Ill.
Ferracute Machine Company, Bridgeton, N. J.
Standard Machinery Company, Providence, R. I.
National Machinery Company, Tiffin, Ohio.
Smith & Mills Company, Cincinnati, Ohio.
New Britain Machine Company, New Britain, Conn.
J. N. Lapointe Company, Marlboro, Mass.

Tuesday Afternoon Session

The paper on "Shop Hygiene as a Factor of Efficiency," by Winthrop Talbot, M.D., of Human Engineering, Cleveland, Ohio, was listened to with much interest.

Dr. Talbot was followed by Dr. W. J. Clark, physician for the Norton Company, Worcester, Mass., who went into details as to the system employed by his company, which embraced the physical examination of all employees when first hired. He pointed out that this frequently prevented the employment of workmen afflicted with tuberculosis or other contagious diseases. A card showing the record of each employee is kept and occasionally it has been a very valuable document in defending damage suits for accidents. Dr. Clark fully explained that once each month different foremen were brought together and given "first aid" instruction. One expert dresser of wounds is retained, who is notified immediately after an accident and he meets the patient at the company's hospital, taking care of him until the doctor arrives.

L. P. Alford, editor of the American Machinist, presented an exhaustive paper on "Standardization of Machine Tools for the Benefit of the User," which he illustrated copiously with lantern slides. In general he stated that there are six important principles in standardization, which he has formulated as follows:

1. Standardize corresponding designations and capacities and establish a method of power rating.
2. Standardize devices for holding cutting tools.
3. Standardize devices for holding work and fixtures.
4. Standardize operating movements.
5. Standardize parts concerned in the setting up of machines with reference to the permanent shop equipment.
6. Accept the geometric progression as a fundamental requisite in designing feeds and speeds.

The application of none of these principles will introduce a radical change in design, for, on the contrary, either through action by this association or through a process of natural development, uniform features can be pointed out substantiating the importance and setting a precedent for the application of each principle.

The Philadelphia Foundrymen's Association

The Philadelphia Foundrymen's Association held its regular meeting at the Manufacturers' Club on the evening of October 4, with President Thomas Devlin in the chair. There was a large attendance of both local and out of town foundrymen.

Charles James, general manager of the Kuebler Foundries, Inc., Easton, Pa., and C. F. Grimes, Standard Roller Bearing Company, Philadelphia, were appointed delegates to attend the Atlantic Deeper Waterways convention at Richmond, Va., October 17 to 20. George C. Davis, official chemist of the association, directed the attention of the members to the work of the committees of the American Foundrymen's Association and the American Brass Founders' Association, who are endeavoring to establish a uniform report card dealing with laboratory reports in connection with the analysis of iron, steel and other metals, as well as ores, coal and coke. At the present time there is a wide diversity in the manner of making these reports, which sometimes results in considerable confusion. W. P. Putnam, of the Detroit Testing Laboratory, Detroit, Mich., is chairman, and Mr. Davis, who is also a member of the American Foundrymen's Association committee, asked that the members of the association forward to him copies of the forms used, so that the committee will be able to better formulate and recommend a uniform card which will fully cover the various requirements. The name of the Standard Roller Bearing Company, Philadelphia, Pa., was presented for membership and favorably acted upon.

The paper for the evening, on "Titanium as a Scavenger versus Titanium as an Element of Value in Metals," by W. A. Pollock Davis, was read, in the writer's absence, by A. A. Miller, but as expected lantern slides for illustrating the paper were delayed it was suggested that the writer deliver the address personally at a later meeting of the association.

Richard L. Moldenke, secretary of the American Foundrymen's Association, addressed the meeting, supporting the remarks of Mr. Davis in regard to the work of standardizing the form of laboratory report blanks. He stated that this would be the banner year for the association in connection with its publications and that the transactions this year would include between 700 and 800 pages of printed matter. He also stated that the 1912 convention of the association would be held in Buffalo, N. Y., and that the committee of the association had recently viewed the facilities offered both for convention and exhibition purposes and found them exceptionally favorable. Dr. Moldenke then, upon request, made an address on general cupola practice, giving his views particularly in connection with the methods of charging, carelessness in which, he said, was a frequent cause of unsatisfactory melting and a bad condition of the iron when tapped. Discussion in this connection was briefly entered into by Dr. E. E. Brown, Alexander E. Outerbridge, Jr., and Charles James.

Pittsburgh and Vicinity Business Notes

The Oil City Trust Company has been appointed receiver for the Holbeck-Riverside Gas Power Company, Oil City, Pa. The company was recently organized, being a consolidation of the Holbeck and Riverside gas engine companies, and was engaged in the manufacture of gas engines.

The Elkins Foundry & Machine Company, Elkins, W. Va., has awarded the contract for the construction of a building which will contain a foundry, 32 x 60 ft.; a machine shop, 32 x 60 ft.; a pattern shop, 42 x 50 ft., office, store rooms, etc.

The Pittsburgh Motor Car Company, 1109 Empire Building, Pittsburgh, expects shortly to secure a suitable site on which to erect a new plant. It is the intention of the company to build a brick and stone structure, 95 x 238 ft., one story.

The Frontier Decorating Machine Company, East Liverpool, Ohio, has been incorporated with a capitalization of \$10,000 by A. O. C. Ahrendt and others.

It is announced that the Penn 30 Auto Company, which has been negotiating for the location of a plant in Warren, Ohio, and other cities, has finally decided to locate in New Castle, Pa.

No. 1 stack of the Shenango Furnace Company, Sharpsville, Pa., which was blown in September 20 on basic iron, started last week to make Bessemer.

The puddling mills of the Sligo Iron & Steel Company at South Connellsville, Pa., which have been idle for some time, started last week. The company is turning out an order for high-grade quality muck bar to be used by a leading chain company in furnishing chain to the United States navy.

Reports that the H. C. Frick Coke Company will build a large block of bee-hive coke ovens in Washington County, Pa., are untrue. It is not the company's intention to build any more bee-hive ovens, and the coking coal from properties recently bought will probably be shipped to the Gary district to be used in by-product ovens.

Sales managers of the Republic Iron & Steel Company in the various cities met in Youngstown, Ohio, on Wednesday and Thursday last week to discuss plans for the coming year.

The Pittsburgh Tack & Nail Company, recently incorporated with a capital stock of \$100,000, is considering plans for the building of a plant at Rochester, Pa.

The Steel Corporation's Unfilled Orders

The statement of the United States Steel Corporation published October 10 showed that the unfilled orders on the books of its subsidiaries on September 30, apart from inter-company business, amounted to 3,611,317 tons, a decrease of 84,668 tons from the total on the books August 31. The statements of the three preceding months had shown an increase. Low point was touched at 2,674,757 tons on December 31, 1910. The amounts reported for the various months of this year are as below, in tons:

Sept. 30, 1911.....	3,611,317	April 30, 1911.....	3,218,704
Aug. 31, 1911.....	3,695,985	Mar. 31, 1911.....	3,447,301
July 31, 1911.....	3,584,085	Feb. 28, 1911.....	3,400,543
June 30, 1911.....	3,361,058	Jan. 31, 1911.....	3,110,919
May 31, 1911.....	3,113,187		

At the end of September, 1910, the total of unfilled orders was 3,158,106 tons. The totals at the close of the various years have been as follows: 1902, 5,347,523 tons; 1903, 3,215,123 tons; 1904, 4,696,203 tons; 1905, 7,605,086 tons; 1906, 8,489,719 tons (the high record); 1907, 4,624,552 tons; 1908, 3,603,527 tons; 1909, 5,927,031 tons.

Under the title "Ganschaw on Gears" the William Ganschaw Company, Chicago, has compiled for the trade interesting information on gears. This company has equipped its shop with unusual completeness in the matter of gear cutting, generating and hobbing machinery and in this book the facilities afforded thereby are fully catalogued. Many suggestions of value to the user of gears, with illustrated diagrams, are presented. Very complete gear tables, giving the circular pitch and corresponding pitch diameters and vice versa of a wide range of sizes, are included among a number of engineering tables of useful information. Attention is given individually to the presentation of specifications for spur gears, bevel, worm and wheel; rack and pinion, rawhide pinion, spiral and special gearing. The book comprises 228 pages, 8 by 5 in. in size. It is printed in colors and tastefully bound in green cloth with gold lettering.

A dispatch from Seattle, Wash., states that application has been made for the appointment of a receiver for the Western Steel Corporation. The company was incorporated in Washington October 2, 1909. The authorized capital stock is \$15,000,000 common and \$5,000,000 6 per cent. non-cumulative preferred stock. It also has \$2,000,000 of bonds. Its steel plant has a daily capacity of 200 tons of merchant bars and light shapes. Action on the appointment of a receiver has been deferred by the court at the request of creditors and stockholders, who will endeavor in the meantime to adjust the company's affairs in a satisfactory manner.

The Garwood Electric Company, Garwood, N. J., for which Charles N. Fowler, Jr., Elizabeth, N. J., has been appointed receiver in chancery, is not only completing its unfilled orders but is also taking new business. The assets of the company are largely in excess of its liabilities. All of the branch offices of the company are soliciting business, as usual, and reorganization plans are now being considered.

Machine Tool Dealers Meet

First Annual Session of the Machinery Section of the National Supply and Machinery Dealers

The Machinery Section of the National Supply and Machinery Dealers' Association held its first annual meeting as a separate body at the Hotel Astor, New York, October 10 to 11. Most of the 85 delegates in attendance were dealers who specialize in the sale of machine tools and metal working equipment, and a large part of the time given over to the business sessions was used in the discussion of matters pertaining to the selling of metal working machinery. W. L. Rogers, president of the association, presided over the meeting and on Tuesday morning he opened the session by outlining the scope of the convention and referred briefly to matters which were to come up for discussion. Following the roll call Henry Prentiss, of the Prentiss Tool & Supply Company, New York, who is first vice-president of the association, spoke on the benefits to be derived from the meeting. He said in part:—

The Benefits of Trade Associations

Doubtless some of our members are asking themselves this question: Why should we employ our time and energies in attending these meetings when they are so much needed to further business interests in the home field. This is a pertinent query which should be satisfactorily answered. Permit me to outline a few of the reasons why we should look upon these meetings with distinct favor.

One of the strong affirmative factors in reaching this conclusion is the benefit of personal acquaintance. Heretofore we have been inclined to look upon our competitor with disfavor, as one who was an unwelcome obstacle in the way of business prosperity. Perhaps we felt that we were justified in using his supposedly doubtful methods to checkmate him. Now, as a result of our coming together our feeling toward our competitor has completely changed. We learn that he had the same misconception of our methods that we entertained of his methods, and that it is his desire and intent to conduct an honorable business, to employ clean and just methods and to treat his competitor fairly. We find that he is facing the same problems that confront us. It has been made plain to us that we have common aims and difficulties which we can work out together to our mutual advantage. Ways and means of conducting business to insure greater returns are an outcome of this intercourse.

Our members are beginning to realize the importance of the expense account; the literature which our secretary-treasurer has sent to members from time to time illustrates what an association can do to focus our attention upon this, one of the controlling factors in business success. We find that the increase of our earning capacity is largely dependent upon the volume of business; that many of our manufacturers are, as yet, unconvinced of the necessity of an increased selling commission. The increased volume, however, is not sufficient to cover the enlarged expense account, hence this problem is becoming daily more perplexing; associated together we are in better position to solve this problem and to accomplish reforms which as individuals we could not successfully cope with.

During these meetings we shall learn from the reports of our secretary-treasurer and committees what has been accomplished during the past year of advantage to our membership. We are to consider the following important subjects: Confidence and co-operation; compensation of salesmen; credits; uniform notes and documents for security on deferred payments; manufacturers' selling policies, which includes close co-operation with the Machine Tool Builders' Association to promote the best interests of the machinery trade, to make it not only more profitable, but to establish more cordial relations with our manufacturers; best methods of handling sales to trade schools and other similar institutions; cost of doing business; service rendered to appraisal companies in connection with the appraisal of machine tools and other equipment; uniform proposal blank with non-cancellation clause.

In this connection I wish to emphasize the importance of reaching a fair understanding among our members handling business in what is termed "open territory," which calls for rigid maintenance of the manufacturers' resale prices, resulting in the fair competition which we employ and enjoy in closed territory. Such an under-

standing will help materially in the net results of the year's business.

Another association which is holding its meetings in this hotel to-day is a forceful object lesson of the benefits derived from membership in a strong and active association. A few years ago this association was comparatively weak and had little influence; it has now grown to be strong and representative and is helpful in many ways to its members. Shall we not profit by this example and through intelligent, persistent and united effort win for our association its rightful place as the representative of an important business industry? The higher thought, i. e., that we only truly receive as we give out, is taking its rightful place in human consciousness. One of the channels through which this thought is manifested is in association work in which individual co-operation, growing out of an understanding of our common needs, brings harmonious action, whose fruitage is an abounding success.

Thomas A. Fernley, secretary-treasurer of the association, presented an interesting report of the organization's affairs and took occasion to point out that the business outlook among machinery men is better at present than it has been in some time.

Edgar E. Strong, of the Strong, Carlisle & Hammond Company, Cleveland, Ohio, presented a paper on "Confidence and Co-operation," the discussion of which brought the morning's session to a close. He said in part:

Confidence and Co-operation

As an instance of the benefit of co-operation which necessarily calls for confidence, I wish to go into a little ancient history. Many years ago the supply business in certain lines was badly demoralized in Cleveland. Certain staples were sold at a nominal profit of one and a half to five per cent., which we now know meant an absolute loss, and not a trifling one at that. Some wise man of sufficient standing to make the matter respectable conceived the idea of getting together and taking action to remedy this condition. The plan found favor and all the larger dealers co-operated and established prices on these money losers which brought them on the right side of the ledger, and for years that class of goods paid liberal profit in our local market, while in other surrounding cities they continued to be marketed at the loss. This was before the days of the Sherman law or our own Ohio Valentine law, and of course we do not now agree upon prices, but the lesson learned then has not been forgotten and we each feel that the other knows an unprofitable job when he sees it and is not out for that kind of business.

Of course some of you are not interested in the supply business, but tell me if you can why the principles of the machine-tool business are any more difficult to harmonize than those of the supply. If there is a difference, is it not easier to adjust in your particular line than in the supply line. Is it not true that most of the high-grade tool builders establish prices at which their tools are sold? Some of them I know do, and are very rigid in their requirements in that direction.

It seems proper to ask whether this association by itself or co-operating with other associations cannot start a campaign of education to bring pressure to bear upon the Congress to so amend the Sherman law act that reasonable regulation of prices, terms, etc., shall be lawful. Under the present law, no one seems to be certain just what it is lawful to do. Recent decisions are construed to prohibit the establishment of prices fixed by the seller on the ground that when a thing is sold the previous owner has no further rights in it and no right to dictate in any way concerning it. The court seems to overlook the fact that real estate, the basis and origin of all wealth, has been sold with restrictions for centuries and continues to be sold.

Tuesday afternoon the dealers listened to a report of the machinery committee presented by O. P. Meckel, Baird Machine Company, Pittsburgh, Pa., in which was outlined the work done by the Machinery Section of the association during the year. J. O. Harron, of Harron, Rickard & McCone, San Francisco, opened a discussion on "Compensation of Salesmen," in which the matter of paying salesmen by salary alone or salary and commission was gone over. The rest of the afternoon was given over to talks on credits and the question of securing payment on material purchased on notes.

The muck bar and merchant iron mills at Canton, Md., of the Canton Iron & Steel Company, Baltimore, have been closed down. When they are likely to resume has not been learned.

Factory Floors

Factory construction, factory arrangement, factory lighting and factory floors were made the special subject of the October meeting of the American Society of Mechanical Engineers, held on the evening of October 9, in the Engineering Societies Building, New York. The general subject was introduced by a formal paper by L. P. Alford and H. C. Farrell, describing the arrangement and construction of the reinforced concrete factory buildings of the United Shoe Machinery Company, at Beverly, Mass. The paper may be obtained in full in the October Journal of the society.

Discussion was prearranged with a grouping under the heads enumerated. The question of machinery arrangement was taken up in part by Alexander Taylor, manager of works, of the Westinghouse Electric & Mfg. Company, East Pittsburgh, and L. D. Burlingame, of the Brown & Sharp Mfg. Company, Providence. Contributions on shop lighting were made by G. H. Stickney, of the General Electric Company, and by C. E. Clewell, of the Westinghouse Electrical & Mfg. Company. In general the pronouncements regarding lighting followed the lines brought out in the recent meeting of the Association of Iron and Steel Electrical Engineers, printed in part in the issue of October 5.

The subject of factory floors was taken up in detail by H. M. Lambourn, of the Yale & Towne Mfg. Company, Stamford, Conn. He expressed decided favor for a wood-wearing surface and reported satisfactory experience with Southern pine and also with maple, the latter wearing smoothly and being favorable from a price consideration. He showed a number of pictures of floors thirty years and older of common cut Southern pine. Lantern photographs were also shown to exhibit the advantage of floors laid with the boards brought tightly together by means of jacks. He emphasized the desirability of having the floor boards laid in the direction of maximum travel, such an arrangement facilitating the removal of such boards as suffer excessive wear. He admitted that the objections to the concrete floor are the amount of abrasive dust which develops and the absorption of body heat. Such a floor is inadvisable where the processes of manufacture entail an expenditure of nervous energy on the part of the operators. The concrete floor was attractive at first, but was subject to wear, and, particularly with a poor foundation, developed cracks which become holes.

Cast iron plates he admitted were good for foundry floors, but he appeared to favor a brick floor. It had the advantage that it was easy to replace. Where rooms had an acid atmosphere or there is necessity for having maximum water resistance asphalt floors were good. He did not dwell on composition floors, but expressed interest in the experiences being gained at the Grand Central Station of the New York Central railroad with different forms of composition floors.

Henry Hess, president of the Hess-Bright Mfg. Company, Philadelphia, described at some length, with the aid of lantern photographs, wood block floors in use in the German Niles works. The foundation consists of sand and solid concrete 8 to 14 in. thick, and the wearing surface of blocks of about the size of the average brick, creosoted and set in tar in the lower part. The cracks between abutting blocks were filled with sand. They were set in uniform straight lines, making it possible to run an electrical conductor, for example, under the floor by removing a line of blocks, and protecting the conductor with a wood channel before replacing the blocks. He showed also some samples of a German composition flooring, of sawdust, preferably of hard wood, in a magnesia compound colored or mottled like marble to suit the desire. This material is $\frac{3}{8}$ to $\frac{1}{2}$ in. in thickness on a base of about $\frac{1}{2}$ in., comprising a cinder concrete with magnesia and having a porous structure. He has found that material does not warp and may be used for foundry patterns although it is somewhat hard on wood-working tools. He regarded the floor lying between wood and concrete so far as the comfort of the operators is concerned. Cracks do not develop in it and it may be rounded at the walls like tile floors in hospitals.

Obituary

JOHN HARTWELL HILLMAN, Pittsburgh, senior member of the firm of John H. Hillman & Son, died suddenly of heart failure at his residence October 10, aged 70 years. He was born in Montgomery County, Tenn., served in the Confederate army under General Forrest, and subsequently with his father and brother, under the firm name of Daniel Hillman & Sons, operated charcoal blast furnaces and rolling mills in Tennessee and Kentucky for a number of years. Mr. Hillman moved to Pittsburgh in 1886 and engaged in the iron, coal and coke business. He was one of the pioneers in the development of what is known as the Lower Connellsville coke region, engaged in the manufacture of coke in that district and continued in this business up to the time of his death.

GEORGE WEBBER, who was one of the pioneer steam elevator builders in this country, died at Boonton, N. J., October 5, aged 88 years. He established a factory in 1870 at 184 Pennsylvania avenue, Newark, N. J., which is now operated by his sons, George A. and Charles Webber, he having retired several years ago.

THOMAS P. KELLY, president of the foundry supply firm of T. P. Kelly & Co., 534 West Twenty-second street, New York, died September 22 of paralysis after a brief illness, aged 60 years. He was born in Dublin, Ireland, and was graduated from the Waterford College. He came to this country when 21 years of age and immediately entered the foundry supply business as a salesman. In 1885 he established the business of T. P. Kelly & Co., and since that time and until his death was in active charge of the company's affairs. Mr. Kelly was a member of the Foundry and Manufacturers' Supply Association, which was later incorporated as the Foundry & Machine Exhibition Company, and of the Newark Foundrymen's Association, the Philadelphia Foundrymen's Association, the Machinery Club of New York, the New York Municipal Art Society, the Irish Historical Society and other prominent organizations. The business of T. P. Kelly & Co. will be continued as an incorporation by P. A. Kirby, Walter F. Keane and M. F. Kirby.

HENRY L. BRADLEY, secretary, treasurer and manager of the Atlas Mfg. Company, New Haven, Conn., died September 2. He organized the business in 1891, having invented the shelf brackets, coat and hat hooks and ceiling hooks now manufactured by the company; also all the automatic machinery used in producing those products, as well as a new line which the company is about to put on the market.

H. R. IVES, Montreal, Canada, died suddenly last week at the age of 78 years. He was born in Plainville, Conn., and went to Montreal in 1859, where he founded the firm of Ives & Allan, manufacturers of bedsteads, ornamental iron and steel and brass goods. He retired from business some years ago, and in 1908 became connected with the Canada Foundry Company as Quebec representative. He was a member of the Canadian Society of Civil Engineers, the Engineers' Club, the St. James Club, the Canadian Club and several other organizations.

W. M. JONES, assistant treasurer of the Sheffield Coal & Iron Company, Sheffield, Ala., died October 7, following an operation for appendicitis.

Correction.—In the review of the Bucyrus Handbook which appeared in *The Iron Age*, September 28, on page 695, the name of the company making the report upon which the handbook is based was inadvertently given as the Destruction Service Company. The name of the company making the report should have been the Construction Service Company, 15 William street, New York City. This company makes a specialty of building up work that has broken down or that is in danger of doing so, and it will be readily seen that the incorrect title might create a misapprehension of its functions.

Attorney-General Wickersham, who arrived in Washington October 8, authorized the statement that there was no truth in the publication made in New York the same day that a bill in equity had been prepared at Washington and was awaiting him, the purpose of which was to begin suit to dissolve the United States Steel Corporation as a combination in violation of the Sherman law.

The Broken Lehigh Valley Rail

A Discussion of Piping and of a Peculiar Separation in the Steel at the Point of Fracture

The investigation into the causes of the rail failure which was responsible for the wreck on the Lehigh Valley Railroad near Manchester, N. Y., August 25, is still in progress. As it involves no small amount of laboratory work, the results will probably not be available for publication for some time. Considerable interesting detail was brought out, however, in the coroner's inquiry held immediately after the accident, particularly in the testimony of Robert Job, chemist of the Lehigh Valley Railroad, who is vice-president of the Milton Hersey Company of Montreal, Canada. The examination of Mr. Job took a wide range, the object of the questions being to bring out facts as to the practice of rail mills, the specifications of the railroads and the causes of various defects in rails in service. Mr. Job, in referring to the requirements of the Lehigh Valley Railroad and the practice of the mills making rails for that road, said:

A 20 Per Cent Discard

In our practice 20 per cent of the entire weight of the ingot is cut off as discard. Our inspector measures that carefully, because we pay an additional premium for that 20 per cent. In the ordinary mill practice 9 per cent only is discarded, but we prefer to pay for the additional amount in order that we may have better and stronger rails. After the 20 per cent has been discarded the first rail coming immediately below that point is taken for the drop test, and a piece, approximately between 5 and 6 ft. long, is cut off. The next rail coming from the point just after this drop test is stamped with the letter A; the next one is stamped B; the next one C, and the next one D, and so on; and then the cropping that has been previously explained is taken from the bottom of the ingot so as to render that free from any visible defect.

Q. What per cent is cropped off from the bottom?

A. That depends a great deal upon the character of the steel. If it is bad the cropping is kept on further and further up until the steel appears to be good.

Q. Is the cropping taken ever as bad as that from the top?

A. Well, that is pretty hard to state. Then sometimes at the very bottom it is porous, and just as porous at the bottom sometimes as at the top. There is a great tendency for a pipe to form at the top, and on that account special attention is given to that, although equally great care is given to the cropping at the bottom in order to be certain that the steel there is free from any impurities.

Q. The rail in question is an A rail, is it not?

A. Yes.

Asked whether the A rail in any heat is considered the weakest, Mr. Job said: "I consider the A rail, after 20 per cent of cropping has been performed, to be as safe as any rail in the ingot. It would be stronger than, or as strong probably as, a rail from the bottom of the ingot." Asked how 20 per cent was arrived at as the proper amount to be cropped, he said: "We find as a general practice that when 15 per cent is removed there is very little tendency to pipes or other defects in the steel."



Fig. 1.—Broken End of 31-Inch Piece of the Rail that Failed. In the Head is the "Dark Spot" and the Area of "Separated" Metal is Shown on the Left Side of the Head, Extending Down Almost to the Bottom of the Web on the Left Side.

Defective Metal and Piping

It was brought out that the rail which had broken in several pieces when the train passed over it on August 25 was of open-hearth steel, rolled at South Bethlehem, Pa., and weighed 90 lb. to the yard. The specifications called for phosphorus under 0.04 per cent, manganese from 0.80 to 1.00 per cent and carbon between 0.70 and 0.80 per cent. An end piece of the rail 31 in. long was produced and shown to Mr. Job. Both ends of this piece were photographed and reproductions appear in Figs. 1 and 2. Referring to what he called Exhibit B, shown in Fig. 1, which is the broken end of the piece, the coroner's questioner called attention to the dark spot which appears in the head of the rail and asked what it indicated. Mr. Job replied that it indicated a decidedly defective mill practice; that something in connection with the manufacture of the rail caused a depression of the metal at that point. He could not tell precisely how the defect had been produced, but, he added, "there is a separation of the metal immediately under the surface of that spot extending two-thirds of the distance across the entire head of the rail."

His attention was then called to the seam which appeared in the center of the web, and of this he said: "That is technically known as a pipe. It is due to the formation of a cavity which occurs through the cooling of the metal, extending to a point below that at which the cropping was made. In other words, it is a defect of mill practice. Perhaps I ought to say that the seam line is formed as a result of that defect, owing to the fact that when the billet is rolled out into a rail the surfaces come in contact but do not adhere to one another. . . . When a pipe is present in the web it weakens it very little. Where it extends to the top of the head or near the top of the head, there is, of course, a tendency for the steel to smash down, so that ordinarily a rail containing a defect of that kind can be readily seen by the track man. When the defect is in the web, as in this case, a very little weakness results from such a defect, because it is so far below the top of the head that the load is evenly distributed."

Q. From your experience would you say that the test rail which was taken from that heat contained a pipe?

A. It might, or it might not. We know this much, that the rail taken from the top of that heat did not break when subjected to the intense force of 2,000 lb. falling from a distance of 18 ft. upon the rail between the supports. That very rail might, however, have been piped, for I have known personally of rails which have stood four and perhaps more blows under the drop test which have been badly piped.

The Cause of the Break

To the question which of the two defects shown in the broken end of the rail was the more serious, Mr. Job replied: "There is another kind of crack extending three-quarters of the distance across the entire metal in the head which weakens the steel so much that there would be no comparison between its weakening effect and that of a small pipe in the web of the rail."

Asked whether there was any test which would bring to light the defect shown by the dark colored spot, Mr. Job said that it would be disclosed by the drop test. Such a defect could not be seen on the rail even on very close examination, but under the drop test a rail with such a defect would be broken in pieces. It was suggested by the examiner that the rail might have been given a blow when it was laid that would show a defect like that of the dark spot. Mr. Job replied that this was very unlikely, since rails are treated very carefully in laying and are not subjected to any undue shock. "It would be very unwise to make a test of that kind, since the integrity of the rail might be weakened. A heavy blow might start some crack in perfectly sound metal and when once a crack starts it is likely to extend, just like tearing a piece of paper."

Q. What in your opinion, from the examination of the rail and the surroundings, caused that rail to break?

A. I believe that it was some blow from the moving train which was sufficient to extend the crack in the top of the rail clear across—in other words, to break the one-quarter of the metal remaining in the head and thus cause the fracture of the entire rail.

Q. Now, this spot shown on the end of the rail was on which side of the rail with reference to the car wheel?

A. It was on the running edge.

Q. Do you think that the piping would have any effect in the break of the rail?

A. No, sir, I think not. I believe that the original fracture came as the result of the weakness in the head, as I have said, from the fact that only one-fourth or so of the steel remained unbroken at that point. After the first fracture, of course, the impact would naturally break up the rail into a great many pieces.

Q. Can you tell from your examination of the rail how far the defect indicated by this black spot extends lengthwise in the rail?

A. My impression is that it does not extend beyond the immediate surface. I take that from the general appearance of the break, from the fact that it has a comparatively smooth surface, giving an indication that there has been a slight movement between the different portions of the steel.

Q. Have you noticed any such a defect as this in any of the other portions of the rail?

A. Yes.

Q. In how many?

A. I haven't counted the exact number, but from memory I should say in three or four pieces, possibly more.

Q. Were they, as you call it, on the running side of the rail?

A. Yes.

The Cutting of the Rail as a Possible Cause

It developed in the examination that the broken rail was first laid in track in October, 1910, and that it was re-laid in April, 1911. At that time a piece was cut off the end, so that the new end of the rail was as shown in Fig. 2. Referring to the cutting off of the end in April, 1911, the examiner asked:

Q. Would the fact that that rail was cut, using a hammer and chisel, one man holding the chisel, and the other man using the hammer, on the base of the rail, and then dropping it, have any tendency to crack the rail at the place where this spot indicates a defect?

A. No, sir, I think not. I think there would be no chance at all of that.

Q. Would it be possible, in your opinion, to break that rail at that point, in the laying of it, in any way, striking it?

A. No, sir, I may say that one reason why I am quite certain that the crack does not extend is that the color of the fracture is practically the same at one point as at another. If there had been several fractures there would be different degrees of oxidation, and consequently different degrees of color, so that one portion, which we will say was broken originally at the mill, might extend one-half of the distance, and then the next fracture, when it was broken by some heavy blow, would extend the rest of the distance, and we would have a different color, because it would be less oxidized. So that from that appearance I am satisfied that that fracture was originally made at the mill and did not extend after that time. There is every indication of that from the face of the rail.

Q. Do you consider piping in a rail a serious defect?

A. My experience has been that the tendency of piping is to cause a crushing of the rail, a crushing of the steel, which can be plainly seen by the track man, and that, of course, when the pipe extends beyond the web of the rail and pretty well up into the head. Under those conditions, the metal above that point is so small that it is unable to support the load of the trains, and consequently this crushing occurs, and in that case the defect is very readily apparent to anyone walking the track. Generally the head of the rail spreads apart so that it can be very easily seen.

Q. Do you consider piping in the web alone a serious defect of a rail?

A. I might answer in this way, that I have known a rail which contained a pipe in the web to stand 34 years of hard service. It depends, of course, upon the location of the pipe, and the condition of the steel.

Q. In the one which you refer to, where was the pipe located?

A. In just about the same location that this is. From a point just above the base to a point at about the beginning of the head.

The Condition of the Cut End

The cut end of the 31-in. piece (Fig. 2) was then shown and Mr. Job's attention was called to the pipe which starts just above the base and extends into the head. He was asked whether this pipe was more serious than the one in the broken-end of the piece (Fig. 1). He replied that the former would be considered more objectionable from the fact that such a rail would be more likely to mash down in the service, though in the particular rail in question so much solid metal would remain above the pipe that there would probably be but slight tendency to mash. The question was then asked whether the piping in Fig. 2 was visible on April 20, 1911, when the rail was cut off at that point.

A. It would be impossible to state whether or not it was. It might have been in that condition just as it is now, or it might have been in a condition in which no sign of the piping occurred. In breaking off a rail, very often thin portions may adhere, which, in the course of actual service, by rubbing against the next rail or by the jolt and jar of service may have been knocked off from it; so that I am satisfied that in a case of this kind a line such as this had might not have been at all visible. It may have been covered up by some portions of the steel which in the jolting of a number of months has dropped down and gradually exposed the crack; or, of course, it is possible that there may have been a slight tendency to crush down and open up the defect, particularly since this would be at the very end of the rail, where it would receive the hard hammer blows of every wheel which passed over it.

Q. Do I understand you to go on record as saying that where there is piping it cannot be discovered by cutting the rail?

A. I should say that in almost all cases, or in the majority of cases it could be discovered perfectly well, depending, of course, upon the condition of the pipe. In some rails on cutting the entire rail splits apart; and in some places, of course, a large cavity is seen just as soon as the steel is opened. In other cases the piping is less apparent; and, in fact, in many cases which I have seen the two surfaces are in intimate contact, so that there is simply a fine line of demarcation to show; and provided the break comes evenly, as it very often does, it is quite difficult to know that a pipe is present at that point.

Q. Can it be discovered on close inspection?

A. It could be discovered by taking a brush and polishing it and



Fig. 2.—Cut End of 31-Inch Piece, Showing Pipe.

etching it; then the line, and in fact any slight defects which might be present, could be seen by the opening of the line.

Q. Is that difficult to do?

A. It could not be done in track. Ordinarily it is a laboratory experiment.

Mr. Job suggested that a sliver of metal may have covered the upper part of the pipe shown in Fig. 2 when the rail was cut, also that the metal may have been bent over the crack somewhat, so that the pipe was not seen by those who cut the rail. Asked whether the cutting of the rail with a chisel and a hammer would have a tendency to open up the pipe, he said that a good deal would depend upon the conditions under which the rail was broken. "I have seen cases in which it would open decidedly by cutting and I have seen others in which there was no opening of the metal at all."

Molten Ferromanganese for Deoxidation

A Successful Practice in a German Steel Plant

In *Stahl und Eisen* for August 24, 1911, Messrs. Bronn and Schemann discuss the use of molten ferromanganese for deoxidizing purposes. It is well known that there are marked advantages in adding this alloy in the molten state rather than in lumps, but the disadvantages of the cupola, open-hearth furnace or arc-electric furnace are so great that in the melting this value is fully counterbalanced.

As far back as 1906 the Rombacher Works melted its ferromanganese and by tilting the molten metal into the ladle coincident with the converter product assurance was had that the entire amount of the alloy actually reacted with the steel. When lumps of the alloy are simply thrown into the converter at the proper time there is no telling how much manganese gets into the slag. With molten alloy a series of tests has shown conclusively that there is no noticeable difference between the steel of the first and last of the charge. Moreover, in this way very quiet teeming is possible, charges being as high as 23 tons. This was noted with 1000 charges of basic Bessemer steel, where not a single one gave trouble in pouring. Evidently the liquid alloy was so nicely distributed and the deoxidation so thorough that the results were actually surprising. Even with manganese in the steel as low as 0.22 to 0.25, rolling was satisfactory and the crop ends lost very light. The result was that less alloy was used, while the powder usually sticking to the slag was saved.

While the results were so good, it was not easy to get the melting of the alloy itself satisfactory, the ordinary methods with the cupola, etc., oxidizing too much of the manganese. Manganese volatilizes too readily, the boiling point being 3450 degs. F., while iron boils at 4425 degs. F., for the arc electric furnaces. Moreover, in half an hour after starting the manganese smoke was so irritating that tests had to be stopped. The elegant Girod electric furnace, with the hearth electrode of heavy iron bodies, failed completely, as the molten ferromanganese penetrated

into the iron, even when the current was introduced through water-cooled electrodes of heavy and of light sections. In no case could the electrodes be used over three days. In the case of the water-cooled article this was found to have changed to high percentage manganese iron, which allowed water to pass through. It was also difficult to keep the hearth intact, as not only must the alloy be simply melted but it must be highly overheated. As the bath was thinly liquid, the alloy easily penetrated into the cracks of the brickwork and gave trouble. Finally a special composition for the brick overcame this.

As the advantages of liquid ferromanganese were too great to abandon, further researches were made and finally an arc with a potential difference far below the usual one of 45 to 75 volts between electrode and bath was secured. Perfect success was the result. In the case of a six-day campaign, the capacity of the furnace being 1.5 tons, at the end, there was not the slightest trace of an iron increase in the alloy, which would have been the case had any manganese volatilized. Using so small a voltage difference requires close work between electrode and bath surface. In spite of this the wear on the electrodes was not excessive at all (1 cm per working hour), and it is confidently expected that this will be decreased.

The average saving in manganese, which is 35 per cent. by using the alloy in the molten state, amounts to more than double the melting expense and in the works in question often allows the substitution of the basic Bessemer steel thus produced in place of the open-hearth quality.—

R. M.

The Deutscher Eisenhuettenleute's Meeting

Important Papers Presented

BERLIN, September 28, 1911.—At the autumn meeting of the Deutscher Eisenhuettenleute's, held last week in Breslau, an interesting paper was read by Dr. I. Puppe, of Berlin, on American rolling mills. He spent ten weeks in America last spring, and the paper embodied the results of his observations. After describing various American rolling mills and comparing them with German mills the speaker referred to the extraordinary capacity of American mills. The producing capacity of rolling mills, he said, has been developed to an extraordinary degree in America. He referred as an example to the new rail mill at Gary, which can turn out 4,000 tons of finished rails in 24 hours. He concluded that such results were accomplished by building rolls specially adapted for producing the particular line of product desired. In general he found that the American mills are built for producing the largest possible quantities with less regard to quality than in Germany. In view of the excellent results of this system of production there the speaker recommended that German engineers give more attention also to specializing on rolls, so that special rolls be devoted to turning out each single line of product. In this way, he thought, the Germans would be better able to meet American competition in the world's markets. Finally the speaker referred to the claim of the Americans that their machine-tool and power-developing machinery are superior to the German product, and he compared the figures given him in America with what is being done with German machinery to prove that the American claim is unfounded.

One of the most interesting and important papers read at this meeting was that of Prof. Simmersbach, of Breslau, on the use of coke-oven gas in open-hearth furnaces. Referring to the interest created by the application of gas for power development at iron mills, he said that a new value can now be attached to gas as a means of heating the Siemens-Martin furnace. Ten years ago furnace gas, free of sulphur, was regarded as best for furnaces; but now coke-oven gas is gaining the preference owing to its higher heating value. The first successful experiments in applying coke-oven gas in a Siemens-Martin furnace were made so recently as 1907 in Upper Silesia at the Hubertushütte by Director Amende, who mixed it to the extent of 70 per cent. with generator gas for producing steel. In 1909 the Société John Cockerill, of Seraing, Belgium, began to use coke-oven gas for making steel, and in the same year Director Wiertz at Mühlheim used it with a mixture of blast-furnace gas.

The speaker then showed a series of comprehensive tables showing the heating capacity of coke-oven gas, pure and

in mixtures with other gases, together with temperature comparisons within the open hearth furnaces during the process of making steel with such fuel, to show that the temperature in the hearth is considerably higher with coke-oven gas than with the generator gas hitherto in use. Where the maximum flame temperature obtainable with generator gas was 1780 to 1788 deg. C., a temperature of 1850 deg. and higher was easily obtained with coke gas. In this way the producing capacity of the Siemens-Martin furnace is considerably increased; a gain of 15 to 20 per cent. can be relied upon. This means a considerable gain in the saving of heat through radiation, since radiation will be relatively less with a furnace of large production than one of small production. He recommended that the gas be conveyed directly into the furnace without a previous heating, as this would damage its quality, and to use hot air as blast. This would mean a further saving in construction cost, owing to the fact that gas chambers are dispensed with; and hence the furnace roofs can be built much more durably. The durability of the furnaces is precisely the same in using coke-oven gas as in using generator gas.

The transition for generator gas to coke-oven gas can be rather simply effected by mixing blast-furnace gas with coke-oven gas in such proportions that the mixture shall have only a somewhat greater heating value than generator gas. The method of work then remains the same, and the workmen need to learn nothing new; on the contrary, they have easier work, for they will always have a high temperature at their disposal toward the end of a charge. The mixing of the two gases can be made in a simple and effective manner by using gasometers and maintaining the proper pressure. By employing coke-oven gas in the Siemens-Martin furnace it becomes possible to use only coking coal at iron works. Such works can now use with advantage coke-oven gas alone, or mixed with blast-furnace gas, as found desirable. The technical process at iron works is today already at a point of transformation, for the use of gas from coke ovens in the open hearth will reduce the cost of producing open-hearth steel to a considerable extent.

New Hupmobile Plant for Windsor, Canada

The Hupp Motor Car Company, Detroit, Mich., has completed its plans and purchased a site for the erection in Windsor, Ontario, of a plant for the complete manufacture of automobiles for its large and rapidly growing Canadian trade. The factory will be located at the corner of McDougall avenue and Gibbs street, on the Windsor Terminal Railway. The site comprises 3½ acres, and ground was broken October 5.

The factory will be modern in every particular, with a present capacity of 3000 cars per year, but so constructed as to add sections and increase the capacity as required. The main building will house the offices, stock rooms and the various assembling and painting departments, together with the inspection, shipping and mail order departments. Another building, separated from the main building, will accommodate the power and heating plant, motor-test department and rough-test department. The buildings will be erected after the most approved construction, consisting of heavy piers to carry the floors and roof, and the space between the piers practically all glass, thus securing the greatest possible amount of light. Full provisions are being made to care for the comfort of the workmen, and everything necessary in the way of equipment will be installed to insure economical operation and the turning out of the very highest grade of work. The company expects to push the construction of the new plant so as to be ready for occupancy January 1.

The Lake Superior Corporation, at its recent annual meeting, elected the following directors: R. L. Austin, of Philadelphia; Herbert Coppell, of New York; Joseph S. Dale, of New York; T. J. Drummond, of Montreal; Thomas Gibson, of Toronto; J. Tatnall Lea, of Philadelphia; D. C. O. Newton, of Montreal; Frederick McOwen, of Philadelphia; Herbert M. Price, of Quebec; J. Frater Taylor, of Sault Ste. Marie; John T. Terry, Jr., of New York, and Walter K. Whigham, of London. The officers elected are: President, T. J. Drummond; vice-presidents, J. Tatnall Lea, Walter K. Whigham and J. Frater Taylor; secretary and treasurer, Thomas Gibson.

The Osborn Drop-Plate Squeezer

The Osborn Mfg. Company, Cleveland, Ohio, has recently placed on the market a new type of drop-plate squeezer molding machine. This machine is said to be the only drop-plate machine made with the squeezer attachment so that it can be used in three different ways and practically combines the advantages of three machines in one. In the case of many jobs the necessity of using expensive individual stripping plates for each pattern is obviated, while on the other hand the machine is so constructed that it is adapted for use with stripping plates when they are required. Two styles of machines are built, one with a plain base and the other with a wheel base, which is the type illustrated. Fig. 1 is a view of the machine, while in Fig. 2 the pattern is being drawn.

This machine consists of a molding machine with a strong squeezer attachment and is similar in type and construction to the builder's adjustable flask strippers. These machines have a uniform maximum pattern draw of 6 in., which is accomplished, as shown in Fig. 2, by a half turn of the handle, accuracy being assured by the guides to the pattern carrier. The patterns are mounted on plates which drop directly from the flask, drawing both pattern and pins in one operation.

The squeezer attachment is simple, strong and efficient. Sufficient pressure is secured by a powerful leverage combined with a folding toggle which brings the head directly down upon the flask with but little effort on the part of the operator. The springs shown in the lower portion of both engravings operate to hold the squeezer attachment out of the way when the flask is being filled and also act as a counterbalance for the head when it is moved forward and back.

squeezer to be moved readily from place to place. The wheels are made with extra wide rims so as to avoid the cutting of the foundry floor, while the bearings, which are a special inclosed type, keep out sand and grit. Two sizes of machines are built which can be furnished in either



Fig. 1.—A New Drop Plate Squeezer Molding Machine Built by the Osborn Mfg. Company, Cleveland, Ohio.

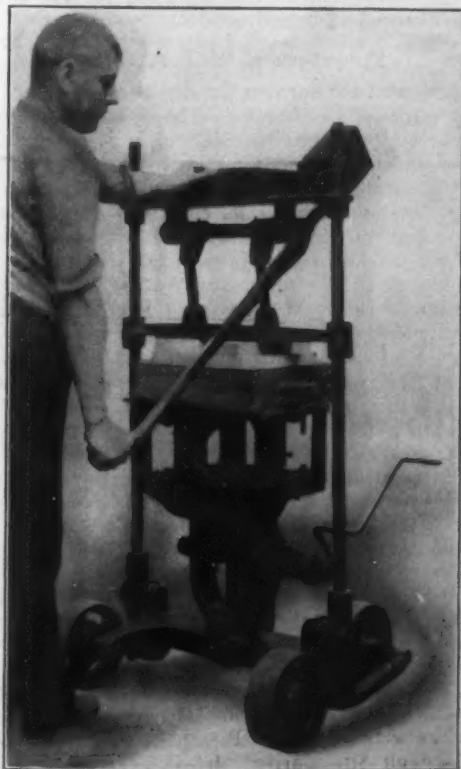


Fig. 2.—Drawing the Pattern.

These machines are made with a plain base or a wheel base, as illustrated. The latter type of machine should be found very convenient in foundries since it enables the

style. The larger size takes flasks ranging from 13 to 16 in. in width, while the smaller one accommodates those ranging from 9 to 12 in. The maximum length handled is 21 in. inside and 27 in. outside for both machines. The adjustment for varying sizes of flasks can be easily made.

Lake Iron Ore Shipments in September

The statement of iron ore shipments from upper lake docks in September shows a total of 5,231,069 gross tons against 6,273,832 tons in September, 1910, a falling off of 1,042,763 tons, or 16.62 per cent. The total of shipments to October 1 this year was 24,837,137 tons against 35,100,864 tons to October 1, 1910. The falling off is thus 10,263,727 tons, or 29.24 per cent. The shipments by ports for the two years, in gross tons, were as follows:

	Sept., 1911.	Sept., 1910.	to October 1— 1911.	1910.
Escanaba	668,595	705,801	3,086,847	3,868,072
Marquette	367,964	439,442	1,568,711	2,689,219
Ashland	368,945	557,858	1,878,786	3,436,829
Superior	1,563,836	1,256,665	7,946,109	6,484,352
Duluth	1,131,247	2,041,908	5,501,364	11,865,552
Two Harbors	1,130,482	1,272,158	4,855,320	6,756,840
Total	5,231,069	6,273,832	24,837,137	35,100,864

Water shipments in 1910 after October 1 were 7,510,327 tons. A similar October and November movement this year would bring the total for the season well above 32,000,000 tons. The probabilities are, however, that this year's total of lake shipments will fall between 30,000,000 and 31,000,000 tons, as shippers expect to move comparatively little ore in November.

At the regular monthly meeting of the Cleveland Engineering Society October 10 an interesting paper on "Profitable Sharing versus Profit Sharing" was read by E. P. Roberts, of Roberts & Abbott, engineers, Cleveland. Owing to the general interest taken in this subject the meeting was an open one. At a special meeting of the society October 24 Charles S. Gingrich of the Cincinnati Milling Machine Company will give an illustrated talk on "Modern Machine Shop Milling Processes."

Electrical Iron Smelting in Sweden*

Design, Performance and Product of a 2500-hp. Furnace at Trollhättan

BY THOMAS DUNCAN ROBERTSON.

The Jernkontoret, an association of Swedish ironmasters founded over 180 years ago, determined to build at Trollhättan an electric shaft furnace of 2500-hp. capacity for smelting iron. They voted a sum of \$90,000 to put up the plant and to further develop the process. The Swedish government, to assist in the undertaking, decided to furnish power at a nominal figure from its Trollhättan station.

In the construction of the furnace two separate portions are to be distinguished, viz.: the shaft and the crucible or hearth. [It is along the lines of the 700-hp. furnace at Domnarfvet, illustrated in *The Iron Age*, September 16, 1909.] The shaft is simply a shell of steel plate lined with firebrick. At the top it is riveted to an octagonal channel iron ring, which bears on two built up beams, these being in turn supported by the walls of the building. At the top of the shaft is a Tholander charging bell, a type of bell peculiar to Sweden which is specially

reduction of the iron ore. The gas is drawn from the cool upper part of the furnace by means of a fan, and blown under the hot roof of the crucible, serving the double purpose of prolonging the life of the roof, and at the same time giving up its heat to, and helping in the reduction of, the charge. The four tuyeres through which the gas is blown are midway between the electrodes. The tap holes, runners and pig iron are those of ordinary Swedish blast furnace practice, the pigs are flat and rectangular and are cast in cast-iron molds. During a large portion of the time the charge has been high in iron and the quantity of slag correspondingly small, so that the iron and slag have been tapped out together, and by means of a small dam the slag has been allowed to run off down a sand trench.

The transformers, electrodes, the tap hole arch and the walls of the hearth are water cooled. The water is pumped from the adjoining canal to a tank on the furnace top, about 100 gal. per minute being used. The electric current is taken through an automatic oil switch to the furnace transformers. These are two in number each of 1100-kva. capacity, oil insulated, with water cooling. By means of Scott connections they transform the three-phase 10,000-volt supply to a two-phase current, the tension of which by altering the number of primary windings can be regulated between 50 and 90 volts. This alteration is carried out while the furnace is working by simply turning a handle, and the arrangements are such that the two phases can work at different tensions.

An elaborate system of pyrometers is installed with holes distributed vertically along the shaft for the thermoelements. Ordinary water manometers are permanently connected to the furnace top, the discharge side of the fan and to a hole in the roof of the hearth. A Mono apparatus constantly records the percentage of CO₂ in the gas from the fan. The laboratory is fitted with gas analysis apparatus, and is well equipped for the analysis of the works materials and products.

Proportions of the Furnace

The design of the furnace was based on the experience of the inventors at Domnarfvet. The calculations assumed a production of 7500 tons of pig iron per year of eleven working months, or 23 tons per 24 hours. A cubic yard of charcoal was taken as weighing 250 lb., 3 lb. of pig iron being obtained from 1 lb. charcoal. In deciding on the correct volume for the furnace it was assumed that half the ore would be contained in the interstices of the charcoal and that the other half would require extra space, and also that the ratio of the volume of charge per day to the furnace volume is equal to 1.55. It was then found that 23 tons of pig iron correspond to a volume of 66.7 cu. yd. of charcoal and an extra space of 10.3 cu. yd. for the ore, making a total of 77 cu. yd. Therefore the volume of the furnace should be $77 \div 1.55 = 49.5$ cu. yd.

The diameter of the neck was the first dimension to be decided upon and this was fixed at 47 in. It appeared desirable to make it larger but this would have necessitated a larger hearth to make room for the electrodes. The shape and depth of the hearth were based on the Domnarfvet experience. A high and narrow shaft would give a good gas reduction efficiency, but would mean a large back pressure against the gas, and a higher cost of construction. A medium was struck at 45 ft. from the ground level to the furnace top.

At the time the furnace was designed carbon electrodes in one piece of the necessary dimensions could not be obtained, so that electrodes were built up of four pieces, 6½ ft. long and 13 in. square. Before being bound together the sides forming the joints were planed true by hand and the joint was made with a thick paste of graphite and molasses. The upper part of the electrode is covered with asbestos millboard and thin sheet iron, to prevent loss of heat.

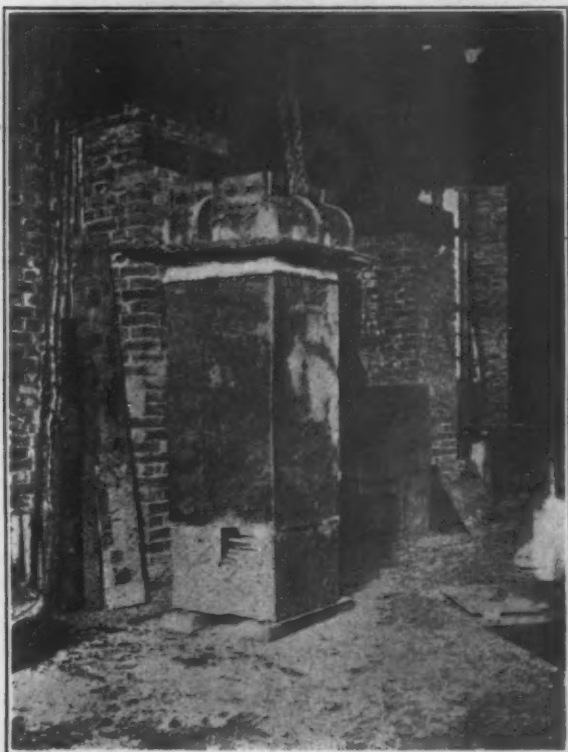


Fig. 1.—New Electrode with Iron Sheath and Contact Frame.

designed to deliver the ore round the sides of the shaft and the charcoal in the center. A 2½-hp. reversible 3-phase motor raises and lowers the bell.

The crucible rests on a concrete foundation. It also has a steel shell, next to which is a lining of firebrick, with an inner lining of magnesite brick, while the bowl-shaped bottom is formed by ramming in a mixture of magnesite and tar. The arched roof is built of firebrick and has four openings to admit the electrodes. These project through the roof at an angle of 65 deg. to the horizontal. At the opening in the roof each electrode is surrounded by a copper water jacket, provided with asbestos packing to prevent the leakage of gas. The electrical contact pieces are wedged between the upper end of the electrodes and a holder of cast steel which is supported in a frame that can be raised or lowered between two guides, one on either side of the electrode.

An important feature of the furnace is the provision made for the circulation of the gases produced by the

*From a paper presented at the meeting of the American Electrochemical Society, in Toronto, Canada, September 21-23.

The furnace was thoroughly dried out with wood and charcoal fires, and heated up electrically by filling the hearth with coke and turning on the current. Charging was commenced on November 15, 1910. The furnace began to produce iron regularly and without difficulty, the first few tappings being rather high in sulphur from the large quantity of coke in the hearth.

The various iron works of Sweden sent their ores to be electrically smelted. In order to gain as much information as possible, the burden of the furnace was constantly altered to vary the grade of iron produced. Such treatment involving the frequent alternation of acid and basic slags was not good for the furnace hearth, and it must be admitted that it was something of an achievement for this to stand six months of this treatment without needing any serious repairs.

Operating Results of Electric Iron Smelting Furnace.				
Periods of operation.....	2	3	4	5
Per cent. iron in ore.....	65.57	65.06	49.50	57.92
Per cent. iron in charge.....	62.1	62.56	42.42	53.06
Slag per ton (2,000 lb.) of iron, lb.....	410	448	1,560	916
Material charged per hectolitre of charcoal, lb.....	146.3	156.5	198.7	153.7
Time consumed in working, hr.....	2,010	184.5	639.3	506.5
Time consumed in interruptions, hr.....	105.6	5	21	22.2
Average load, kw.....	1,319	1,694	1,017	1,733
Kw.-hr. per ton of iron.....	2,087	1,953	2,384	2,403
Iron per kw.-yr., tons.....	4.2	4.49	3.67	3.64
Electrode consumption, per ton of iron, lb.....	22.48	21.68	18.38	14.9

Period No. 1 covers the firing up of furnace on Nov. 15, 1910; Per cent. of iron in ore, 64.92; per cent. of iron in charge, 59.8; slag per ton of iron, 780 lb.; time consumed, 7 hr. 50 mm.; average load, 1,121 kw.; kw.-hr. per ton of iron, 3,454; iron per kw.-yr., 2.54 tons.

Results of Operation

In the accompanying table is given a summary of working results for the period November 15, 1910, to April 9, 1911. As might be expected the output per kilowatt-year is proportional to the percentage of iron in the ore, but with ores producing a greater quantity of slag the electrode consumption is smaller. The thermal efficiency of the furnace was carefully worked out, when it had been running for five months, after which time the lining had worn rather thin, so that radiation losses were probably higher than normal. However, 80 per cent. (the figure obtained) compares favorably with 82 per cent. for the efficiency of the Swedish charcoal blast furnace, and with the 70 per cent. of the English blast furnace.

As the volume of the furnace and gas piping is constant an excess of gas is being continually produced, proportional to the amount of ore reduced. This gas is allowed to burn into the air at present at Trollhättan, but in the newer plants arrangements are to be made for



Fig. 2.—Half Consumed Electrode Showing Line of Surface of Charge.

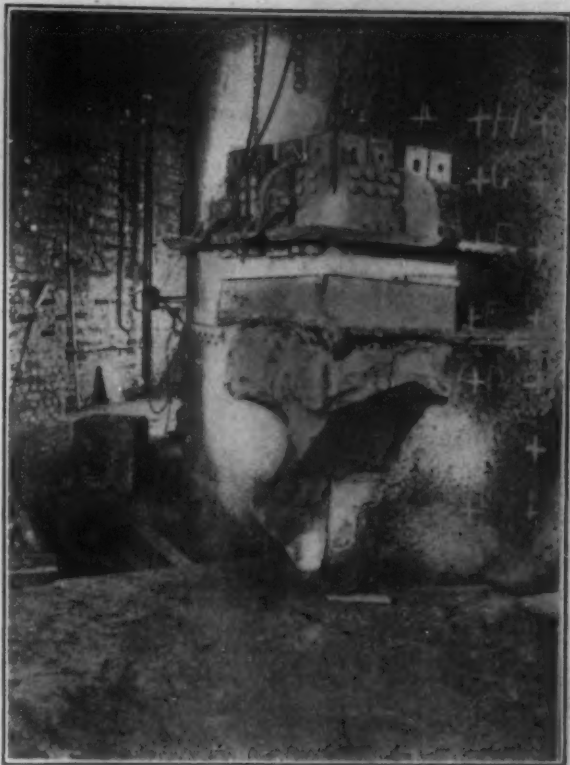


Fig. 3.—Stump End of Electrode Used as Long as Possible.

using it for calcining purposes. About 19,400 cu. yd. of gas are produced per ton of pig iron, and each cubic foot will develop 240 to 285 B.t.u., as the gas averages about 80 per cent. combustible.

When calculating the various charges the quantity of charcoal is kept constant at 6½ hectolitres and the amounts of ore and limestone are varied to produce the desired grade of iron, a typical charge at the time when the author was present at the furnace being:

Magnetite 266 kg. (585 lb.)	} 410 kg. (902 lb.)
Concentrates 133 kg. (293 lb.)	
Mill Cinder 11 kg. (24 lb.)	
Limestone	32 kg. (70 lb.)
Charcoal 6½ hectolitres or 100 kg. (220 lb.)	

This is dropped into the furnace at one raising of the bell and tappings are made every 18 charges, or about once every six hours.

The conditions governing the grade of iron produced are similar to those in the ordinary blast furnace, except that the irregular influence of the air blast is absent. The furnace gives the maximum output when making white iron, as the making of grey iron requires a rather higher temperature and consequently a greater power consumption. By increasing the amount of ore in the charge when the furnace is making white iron, a low carbon iron with very little silicon is produced; a typical analysis of which is as follows:

	C.	Si.	Mn.	S.	P.
Percentages	2.60	0.10	0.11	0.02	0.01

This iron naturally is full of holes, but instead of these having colored oxidized surfaces, they are silvery white; the absence of oxygen from the furnace atmosphere accounting for the production of this grade of iron free from oxides. The results of making steel from this iron are given later.

The tension employed varies greatly and depends mainly on the resistance of the charge. This broadly speaking increases with the amount of slag produced and with the wear of the electrodes but decreases as the amount of charcoal in the charge becomes greater. The maximum power allowed is 1900 kw. and to avoid overheating the electrodes the current must not exceed 17,000 amp., so that the voltage has to be regulated accordingly.

The wearing of the electrodes has given rise to some curious and interesting results. In Fig. 1 is shown a new electrode with its iron sheath and contact frame. When this is placed in the furnace, the bottom end projects into the actual charge and is gradually abraded and consumed. Between the stock line and the roof is a space filled with

furnace gases which contain about 15 per cent. CO_2 so that the portion of the electrode exposed to them is very gradually oxidized. The results of this is shown in Fig. 2 where the half-consumed electrode was removed for inspection, the line of the surface of the charge being clearly visible. Fig. 3 shows the stump end of an electrode which had been lowered as far as possible into the furnace and kept there until unfit for further use. It will be seen that two of the four carbons which compose it have been burnt through to the center. About three weeks is taken to burn through an electrode above the stock line, so that in practice each electrode is lowered once every two weeks, to ensure regular working without risk of fracture, which



Fig. 4.—Effect of Stream of Carbon Dioxide on an Electrode.

would result in a lump of electrode being left in the charge. With the object of cooling the roof immediately behind the electrodes gas was blown in beneath the water jackets during a portion of the time. The effect is shown in Fig. 4, the CO_2 in the stream of gas having burnt a hole in the electrode, causing this practice to be discontinued.

Field of Application of the Furnace

A point of interest is the success met with in smelting magnetic concentrates at Trollhättan. The design of shaft in this particular case is not considered suitable for the purpose, being too narrow, but in spite of this, 65 per cent. of finely divided concentrates caused no inconvenience in working. The inventors of the furnace are of the opinion that, with a specially designed shaft, charges of all fine concentrates could be smelted. Canada is rich in deposits of iron sands and lean magnetites, which are easily concentrated, but which are expensive to nodulize or briquette into a form suitable for blast-furnace smelting, so that where these are within easy reach of water powers, there seems to be a good field open for electric smelting.

Dr. Haanel, in his report on the experiments made at Saulf Ste. Marie, mentions that no difficulty was experienced in smelting titaniferous ores electrically, and it is interesting that the Swedish experience bears out this point, although no ores were used with more than 0.8 per cent. TiO_2 . The electric smelting of ores with high sulphur content is another interesting problem. Dr. Haanel was successful in producing low sulphur iron from sulphurous ores, but in Sweden there are practically none of these ores mined, so that this point was not confirmed on a large scale at Trollhättan; however, there can be little doubt that the electric furnace, with its reducing atmosphere and basic lining of the hearth, permitting as it does of the use of a slag very rich in lime, offers the

best method of producing sulphur-free pig iron from ores containing that unwelcome element.

The pig iron produced by the furnace was sent to various Swedish iron works for conversion into steel in open-hearth furnaces. The characteristic feature of electric pig iron is its freedom from oxides; and in consequence electric pig of normal silicon content (say, 1 per cent. and over) takes a longer time and more ore to convert into steel than ordinary blast-furnace grey iron. Low-carbon electric pig iron, however, is found to give surprising results, charges made up of 50 per cent. of this iron and 50 per cent. of scrap producing hot fluid steel with considerable saving of time over ordinary practice. As was to be expected, the open-hearth furnace managers looked somewhat askance at this iron at first, as they knew the disastrous effect of using low-carbon iron full of holes from the blast furnace; however, after giving it a trial the workmen asked for more, as they said that the furnace worked better and more rapidly with the new pig iron. Fortunately for the electric furnace in Sweden, it is more economical to make the white iron that the steelmakers prefer than to make high-silicon grey iron. Thus it may be maintained, on the strength of the experience gained, that for the open-hearth process, high-silicon contents are detrimental rather than advantageous, while in the blast furnace pig iron a certain quantity is necessary to neutralize the defects of a reduction process less perfect and ideal than that employed in the electric furnace.

Changes Induced by the Tests

The Trollhättan furnace was shut down at the end of May of this year in order to make certain alterations suggested by the results of its six months' campaign. Two of these deserve mention.

1. Since the furnace was designed, the manufacture of large carbon electrodes, of high conductivity, has made great progress. It is now possible to obtain cylindrical electrodes of $23\frac{1}{2}$ in. diameter, fitted with screw joints. These have recently been installed at Trollhättan, and result in two considerable improvements, the first one being that the loss due to stump ends is done away with, as when an electrode becomes too short a new one can be screwed on above it. The second one is that the electrical contact can be made at the point where the electrode enters the roof, in this way saving about 40 kw., which with the old arrangement was lost, due to the resistance of the whole length of the electrode through which the current had to pass. This new arrangement will permit of the furnace taking 3000 hp. instead of 2500 hp.

2. The other important alteration is in the gas-circulating arrangement. The old dust-catcher was not very effective, as only very fine dust is expelled from the furnace. The result was that the dust collected in the centrifugal fan, and had it not been that this was kept fairly clear by a jet of water, would have choked up the blades in a few hours; as it was the fan had to be stopped and cleaned every week. Now a water-scrubber takes the place of the dust-catcher, and a fan on the ground floor blows the cleaned gas into the furnace, an extra fan being held in reserve.

At the present time the following "Electrometall" furnaces are either working or in course of erection:

Sweden—Trollhattan, one furnace.....	3,000 hp.
Domnarfvet, one furnace.....	4,000 "
Hagfors, two furnaces (3,000 hp. each).....	6,000 "
Norway—Tyssedahl (Hardanger), two furnaces (3,500 hp. each).....	7,000 "
Arendal, two furnaces (2,500 hp. each).....	5,000 "
	25,000 "

In these newer furnaces three-phase current is used, and by means of three single-phase transformers, low tension current is furnished to six carbon electrodes. Owing to the recent improvements in electrode manufacture and furnace design, it is now possible to construct units up to 6000 hp., which it is expected will work for two years without serious repairs to the hearth. Rather more than three metric tons of pig iron are produced by the electric furnace per electrical horsepower-year, using one ton of charcoal for the reduction of the ore. The blast furnace uses about three times this amount of fuel per ton of iron, so that in Sweden, where, owing to the demand of wood for the pulp industry, the price of charcoal is yearly advancing, there is a great field open for electrical smelting on account of the saving in fuel. The furnaces in Norway have a somewhat different form of shaft, as coke is the

fuel employed for smelting. The volume of the shaft is smaller, but its diameter is greater than the corresponding shaft of a charcoal furnace. The coke in the charge gives a greater conductivity, so that a lower tension has to be used.

The comparative costs of electric and blast furnace smelting depend in general on the cost of suitable fuel and electrical energy, as the electric furnace simply substitutes one electrical horsepower-year for two metric tons of blast furnace fuel.

Large Double-Acting Cam Press

What is said to be the largest double-acting cam and crank press now built in the United States was purchased by the H. A. Matthews Mfg. Company, Seymour, Conn., from the Waterbury Farrel Foundry & Machine Company, Waterbury, Conn. This press is used for cutting and forming heavy steel parts, and will cut and draw cups having a minimum diameter of 16 in. from metal $\frac{3}{4}$ in. thick and heavier. It enables certain classes of large work to be turned out in one operation instead of two, as was previously the case, on account of there not being presses sufficiently large to handle this work. The installation of this press has resulted in the production of work of at least half the former cost in many cases.

The arrangement of the slides is such that the cutting slide comes down, cuts the blank and remains at the bottom of its stroke while the center slide comes down and performs its operation. After this slide has risen a short distance, the cutting gate begins to rise also. On account of the massive construction of the press and the heavy work handled by it two $\frac{1}{2}$ -in. tie rods are attached to the front of the press to avoid any spring in the frame. The frame, the cutting and the drawing slides and the cutting slide ring nuts are of cast iron. Steel castings are used for the upper and lower yokes and the cams and the cam rolls are hardened and ground tool steel. Bronze bushings are provided for the cam rolls.

The press is double back geared. The cast-iron gear on the crank shaft is driven by the steel casting pinion on the back shaft, and the cast-iron gear on this shaft is driven by a machine steel pinion on the driving shaft. This last shaft has a 42-in. flywheel with a 6-in. face and a 36 x 10 in. Falls friction clutch pulley. The friction clutch

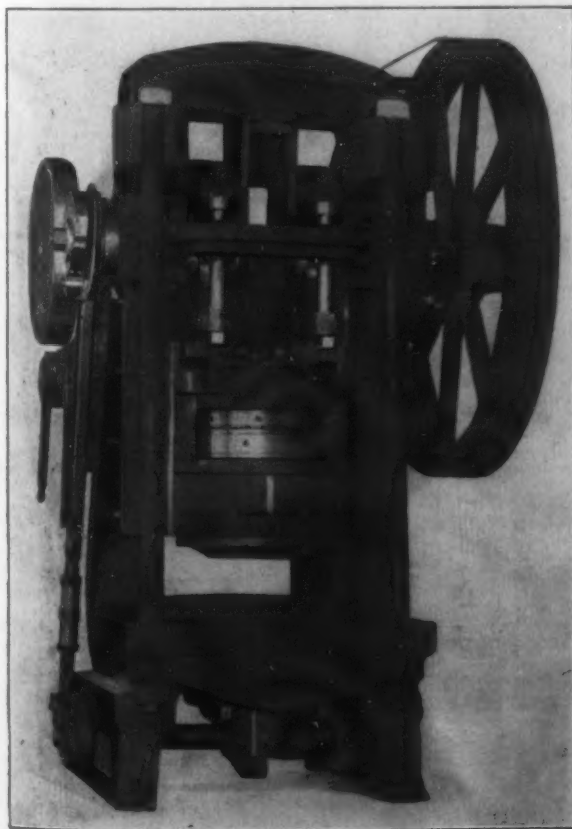
is rated at 22.8 hp. at 100 r.p.m., and is intended for moving the slides slowly in setting the tools. The shipper lever at the side of the press controls the engagement and disengagement of the friction clutch.

The knockout consists of a pin in the bed operated by a lever from a horizontal shaft that receives its motion from an arm and side connection operated by a cam on the crank shaft. The hub of the knockout cam has teeth cut in it which mesh with others in a disk on the crank shaft, an arrangement which enables the knockout to be timed easily. The upper and the lower halves of the knockout connection are steel castings and machinery steel is used for the turnbuckle. The press is equipped with a three-key clutch with springs attached to levers pivoted on the frame for pulling on the levers and throwing off all three keys into slots in the wheel hub when the treadle is depressed by the operator.

The equipment of the press includes a cast-iron bolster plate 4 in. thick with T slots for receiving the tools. A cast-iron punch plate is also furnished. The following table gives the principal dimensions and specifications of the press:

Diameter of crankshaft in journals, in.....	7 $\frac{1}{2}$
Distance from bed to center of crankshaft, in.....	77
Distance from bed to bottom of cutting slide, when down, in.....	17
Distance from bed to bottom of drawing slide, when down, in.....	22
Stroke of cutting slide, in.....	12
Stroke of drawing slide, in.....	10
Distance from top of bed to bottom of ways, in.....	17
Distance between ways, in.....	38 $\frac{1}{2}$
Diameter of cutting slide, bottom, in.....	34
Diameter of drawing slide, bottom, in.....	16 $\frac{1}{2}$
Distance between uprights at bed, in.....	39 $\frac{1}{2}$
Distance between slide center and back of bed, in.....	10
Distance between slide center and front of bed, in.....	25 $\frac{1}{2}$
Width of bed, in.....	63 $\frac{1}{2}$
Diameter of opening through bed, in.....	17
Thickness of bolster plate, in.....	4
Diameter of hole in bolster plate, in.....	10
Diameter of tie rods, in.....	4 $\frac{1}{2}$
Stroke of knockout, in.....	4 $\frac{1}{2}$
Ratio of gearing.....	25 to 1
Diameter of flywheel, in.....	42
Face width of flywheel, in.....	6
Weight of flywheel, lb.....	980
Diameter of friction pulley, in.....	36
Diameter of countershaft, in.....	2 $\frac{7}{16}$
Length of countershaft, in.....	72
Diameter of tight and loose pulleys, in.....	24
Face width of tight and loose pulleys, in.....	8 $\frac{1}{2}$
Diameter of driving pulleys, in.....	42
Face width of driving pulleys, in.....	8 $\frac{1}{2}$
Speed of countershaft, r. p. m.....	320
Weight of countershaft, lb.....	920
Over-all height, in.....	116
Floor space, in.....	116 x 108
Weight of press, including bolster and knockout, lb.....	62,320

This press was set up for testing at the builder's factory and was then taken down and shipped in sections, two complete cars being used.



An Exceptionally Large Double-Acting Cam Press, Built by the Waterbury Farrel Foundry & Machine Company, Waterbury, Conn.

The New Era Gas Engine Company, Dayton, Ohio, on account of its surrounding conditions, has been compelled to seek a more suitable location, and after giving the question several months' thought and study has decided to locate in Portsmouth, Ohio. Its new plant, now about completed, will consist of a machine shop, pattern shop, erecting shop, forge shop and foundry, all thoroughly equipped with the most modern machinery. With these improved facilities the company will be able to produce, in the shortest possible time and in the very best manner, a complete line of gas and gasoline engines as follows: Little Giant single-cylinder horizontal engines, 8 to 20 hp.; New Era single-cylinder horizontal engines, 8 to 70 hp.; Improved New Era throttling engines, 25 to 80 hp.; improved 2, 3 and 4-cylinder vertical engines, 60 to 250 hp., throttling type. A. M. Sullivan will continue to give the business his personal attention. The company's address is now Portsmouth.

The Stephenson Charcoal Iron Company, Wells, Mich., has placed the following contracts for work in connection with its new blast furnace plant: Plate work, structural work and boilers, Muskegon Boiler Works, Muskegon, Mich.; hot blast stoves, Lake Shore Engine Works, Marquette, Mich.; blowing engine, Weimer Machine Works Company, Lebanon, Pa.; pumping machinery, Henry R. Worthington, Philadelphia office; hoist equipment, Otis Elevator Company, Pittsburgh office. The foundations for the plant are nearing completion and the construction of the buildings is well under way. Frank C. Roberts & Co., Philadelphia, are the engineers for the company.

The Sterling Air Economizer

A New Device for Overcoming Lost Pressure and Eliminating Condensation in Compressed Air Lines

In the operation of a compressed air system where air-driven tools are in service at a considerable distance from the compressor plant and long lines are necessary it is not uncommon to expand the air with some heating arrangement near the end of the line and thus restore some of the pressure dropped. This heating also removes a large portion of the moisture in the air, thus obviating the condensation at the tool. A new device for this purpose and one admitting of automatic regulation has been developed by the Sterling Equipment Company, Peoples Gas Building, Chicago, Ill., and is known as the Sterling air economizer. The object of the device is to maintain any predetermined temperature in a compressed air line under

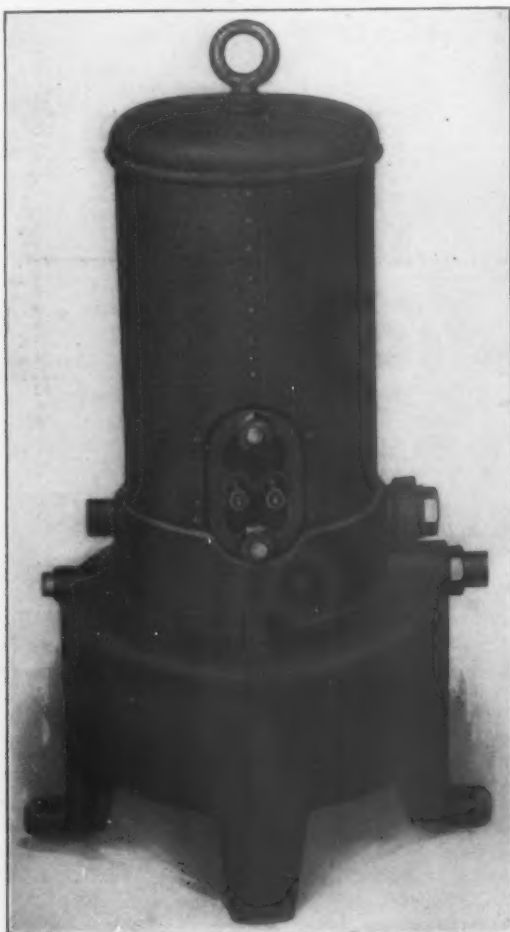


Fig. 1.—The Stationary Type of Air Economizer Built by the Sterling Equipment Company, Chicago, Ill.

accurate regulation by a continuous ignition internal combustion of vaporized liquid fuel.

The claims made for the Sterling air economizer are based on the following analysis: The temperature required to increase the volume of compressed air from 30 to 50 per cent. ranges between 300 and 500 deg. F., which temperatures are practicable and easily maintained in this apparatus. Assuming an absolute temperature of air on the line at 511 deg., corresponding to 50 deg. F., to be increased 300 deg., or to an absolute temperature of 811 deg., it follows in accordance with the law of gases under heat treatment that the volume of the air is increased $(811 - 511) \div 511 = 0.587$, or 58.7 per cent., which represents an actual saving of 37 per cent. with reference to the entire volume of air. It is further claimed that this addition of 37 per cent. to the tool capacity for a given compressor output is obtained with a much lower expenditure of heat than is required for the production of an equivalent amount of mechanically compressed air. In support of this contention it is stated that to produce 1 cu. ft. of air at 100-lb. pressure in an ordinary steam-actuated com-

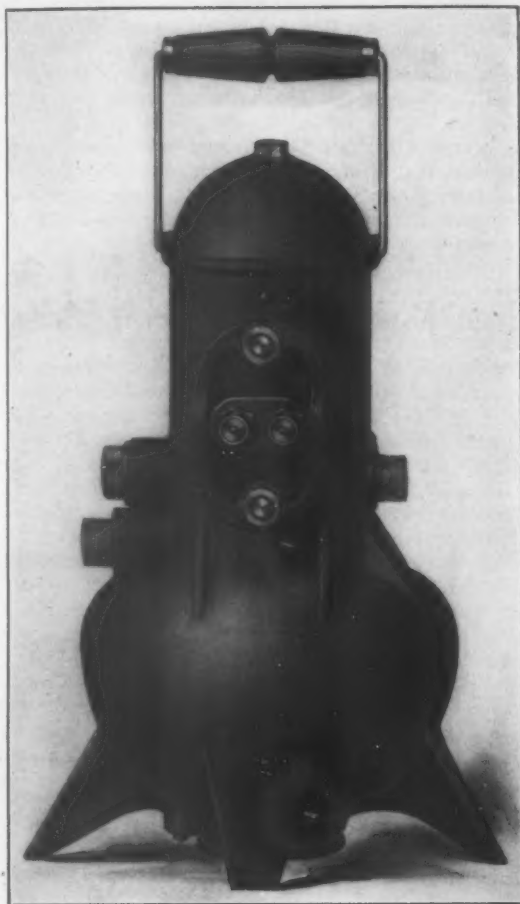


Fig. 2.—The Portable Type of Economizer.

pressor approximately 2 cu. ft. of steam at the same pressure are required, which work involves the expenditure of 620 heat units. In comparison, an equal expansion of air is obtained through the air economizer with expenditure of only 63 B.t.u.

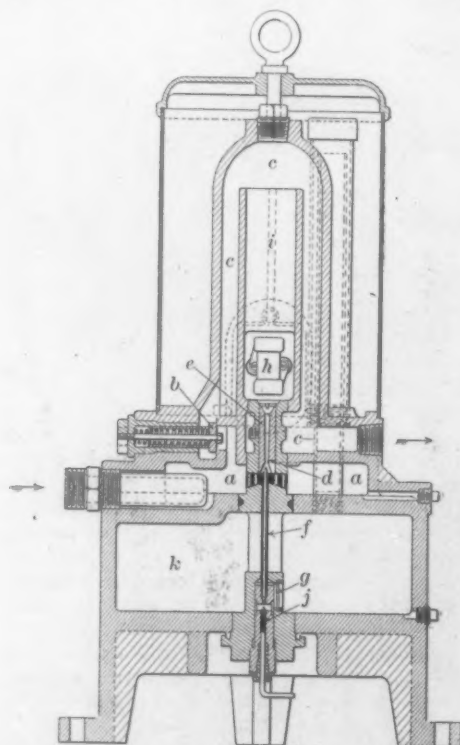


Fig. 3.—Sectional Elevation Showing Constructional Details.

The accompanying illustrations, Figs. 1 and 2, show the economizer in both the stationary and portable types. The latter can be made in capacities up to 250 cu. ft. of free air

per minute. Its operation is controlled by the flow of air and combustion can only begin with the passage of the air through the economizer and ceases when the throttle valve of the air tool is closed. Any increase in temperature desired is controlled from one valve. As a result there is no waste fuel and no overheating of the air while the tool is not operating. The device operates equally well on gasoline, kerosene or any high grade distillate of crude oil and the heated air is maintained free from smoke by completely surrounding the combustible mixture of vaporized fuel oil in the combustion chamber by an excess of air. Ignition is effected by means of a small electric resistance coil, using either 110 or 220 volt alternating or direct current, or by a hot tube.

From the cross-sectional elevation, Fig. 3, it may be seen that when the tool is started the air enters the space *a*, and about 95 per cent. passes through the valve *b* into

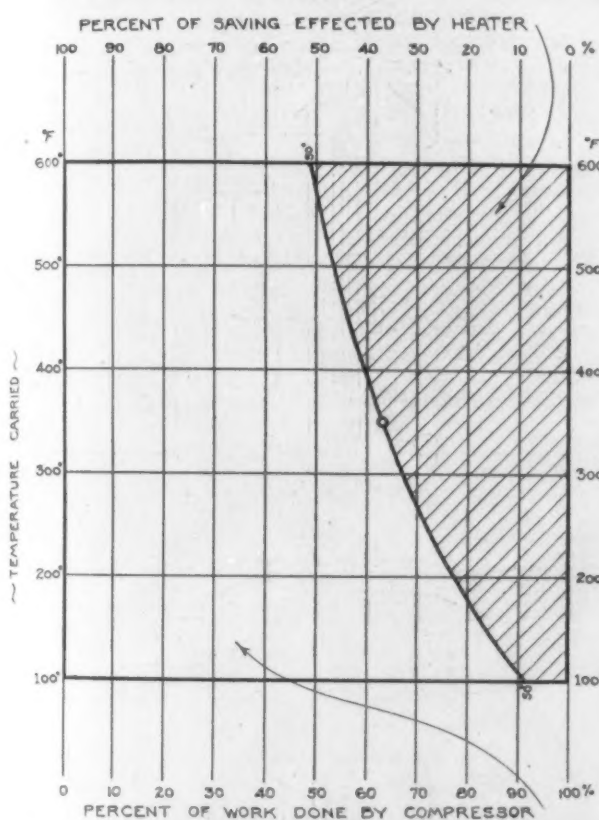


Fig. 4.—Curve Showing Saving Effected by Using Economizer.

the space *c*. The rest of the air passes through the inspirator opening *d* and mixing tube *e* and forms a combustible mixture with the fuel oil drawn from the tube *f* at the point *d* when the needle valve is opened about a quarter turn, thus admitting fuel oil through the screen *g*. This mixture is ignited by contact with the resistance coil *h* and is burned in the combustion zone *i* at a very high temperature. It then mixes with the air in the space *c* and uniformly heats the entire volume to the desired temperature, the increase being controlled by the fuel needle valve *j*. The pressure of the air in the compartments *a* and *k* is kept the same by a balancer pipe and is a fraction of a pound more than that in the inspirator opening due to the floating deflector *b*, the difference in pressure being sufficient to raise the fuel oil through the tube *f* to the nozzle. The instant the air commences to pass through the heater combustion begins and ceases when the tool is shut off. The needle valve *j* is the only adjustment on the heater, and when this valve is once set the action of the heater is uniform and a constant temperature is maintained. The only attention required by the heater is the renewal of the fuel supply. Approximately $2\frac{1}{2}$ gal. of gasoline or kerosene will heat 100 cu. ft. of free air per minute from 50 to 350 deg. for a 10-hr. continuous run.

The blast furnace of the Thomas Furnace Company, Milwaukee, Wis., is now undergoing repairs. The company has just completed the building of two T. E. Thomas patent stoves 18 x 90 ft.

August Iron and Steel Exports and Imports

The report of the Bureau of Statistics of the Department of Commerce and Labor for August shows an increase in both the exports and imports of iron and steel as compared with the figures for July. The total value of the exports of iron and steel and manufactures thereof, not including iron ore, was \$20,704,154 in August as compared with \$18,052,337 in July, while the value of similar imports in August was \$2,282,466 against \$2,015,692 in July.

The exports of commodities for which quantities are given totaled 176,269 gross tons in August, against 162,282 tons in July. The August exports were exceeded by those of March and April, those of March having been 215,667 tons and of April 227,832 tons. The details of the exports of such commodities for August and for eight months of the fiscal year ended with August, compared with the corresponding periods of the previous year, are as follows:

Commodities.	August		Eight months	
	1911. Gross Tons.	1910. Gross Tons.	1911. Gross Tons.	1910. Gross Tons.
Pig iron.....	8,801	11,652	85,378	70,865
Scrap.....	6,158	2,003	37,596	14,952
Bar iron.....	1,294	1,967	12,301	13,307
Wire rods.....	1,536	1,227	11,100	15,853
Steel bars.....	11,619	10,167	82,797	68,536
Billots, ingots and blooms.....	12,005	2,025	161,424	9,682
Steel rails.....	41,879	24,726	311,732	243,244
Iron sheets and plates.....	8,613	7,756	73,027	69,130
Steel sheets and plates.....	19,804	18,776	146,183	110,522
Tin and terne plates.....	5,804	530	36,094	7,586
Structural iron and steel.....	16,508	15,177	142,173	104,219
Barb wire.....	7,130	6,301	54,280	48,680
All other wire.....	11,058	6,295	85,353	60,949
Wire nails.....	3,227	4,119	33,061	29,686
Cut nails.....	1,278	883	7,155	4,709
All other nails, including tacks.....	1,163	882	8,510	6,272
Pipe and fittings.....	18,392	16,580	130,176	105,140
Totals.....	176,269	131,066	1,438,340	983,332

The imports of commodities for which quantities are given totaled 19,685 gross tons in August, as compared with 15,252 tons in July and 36,879 tons in August, 1910. The details of such imports for August and for eight months of the fiscal year ended with August, as compared with corresponding periods of the previous year, are as follows:

Commodities.	August		Eight months	
	1911. Gross Tons.	1910. Gross Tons.	1911. Gross Tons.	1910. Gross Tons.
Pig iron.....	10,447	20,029	107,999	159,947
Scrap.....	851	1,882	13,423	62,271
Bar iron.....	2,698	3,769	19,195	28,655
Billots, bars and steel forms, n.e.s.....	3,971	4,513	21,366	32,108
Sheets and plates.....	138	689	1,549	4,761
Tin and terne plates.....	298	4,072	12,706	51,082
Wire rods.....	1,282	1,925	11,283	14,523
Totals.....	19,685	36,879	187,521	353,347

The heavy decline in tinplate imports is noteworthy. The imports of iron ore in August were 175,183 gross tons against 200,845 tons in July and 282,940 tons in the month of August, 1910. The total importations of iron ore for eight months of the fiscal year ended with August were 1,177,896 gross tons, against 1,791,025 tons in the corresponding period of 1910. Of the August imports of iron ore 114,565 tons came from Cuba, 37,800 tons from Newfoundland, 11,704 tons from Canada, 10,596 tons from Sweden and 518 tons from other countries.

The total value of the exports of iron and steel and manufactures thereof, not including iron ore, for eight months of the fiscal year ended with August was \$164,608,574 against \$130,148,124 in the corresponding period of 1910. The total value of the imports of iron and steel and manufactures thereof, exclusive of ore, for eight months of the fiscal year ended with August was \$20,226,510 against \$27,759,334 in the similar period of 1910.

Last week the steel steamer Grayson was launched at the Ecorse yard of the Great Lakes Engineering Works at Detroit. The Grayson is the first launched of four package freight steamers to be built for trade on the Atlantic coast. She will be enrolled at Wilmington, Del. It is proposed to send her to the coast before the close of navigation. The Grayson is of Welland Canal size and in many ways differs in construction and equipment from vessels turned out for the lake trade. One point of difference will be in the placing of her machinery amidship instead of aft.

The Jenckes Valve Gear

A Corliss Type for Gas Engines

Under patents recently granted, J. M. Jenckes, 41 Pratt street, Providence, R. I., has placed on the market a new type of valve gear for gas engines. Among the special advantages claimed for this gear are reliability in operation comparable to that secured with the steam engines of the same size, positive closing of the valves, elimination of gears in the direct drive of the valves, the doing away with the long cam shaft and ease of making repairs. Fig. 1 is a view of the gear and Fig. 2 shows its application to a gas engine.

This gear can be applied to an engine already constructed, although it is also incorporated in a new type of engine which the inventor has designed. The bed is of the side crank quarter box type and is of heavy construction, the section through the crosshead guides being square. The connecting rod, the crank disk and the crosshead in general follow high grade steam engine practice except that they are heavier. The cylinders, which are simple in construction, are cast in one piece. The exhaust

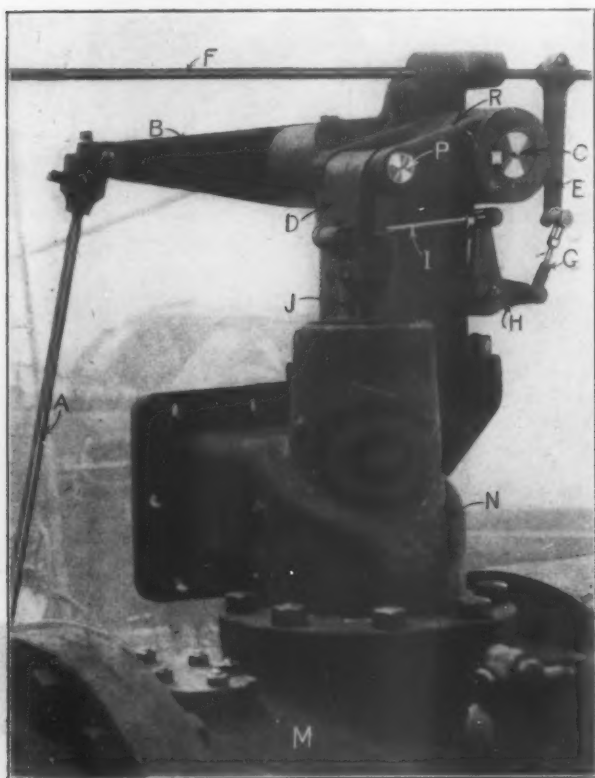


Fig. 1.—The New Gas Engine Inlet Valve Gear, Patented by J. M. Jenckes, Providence, R. I.

valve housing is bolted to the side of the cylinder and has a water jacket, an arrangement which permits the valve stem to stand vertical, thus giving good water circulation in the valve. The valve is partly balanced, which makes it easier to open and it can be readily removed for inspection. The pistons are two in number, each mounted in the middle of a hollow piston rod. The rods are joined between the cylinders and there is a sliding support at each end and in the center at the point where the rods join, thus relieving the cylinders of all wear from the pistons. The cooling water enters at the center and has a separate circulation path to each piston and discharges into the bed at one end and into the tail-rod support at the other. The connections on the piston rod are constructed in such a way that the rod can turn without affecting the sliding supports or breaking the water connections. If desired the piston and the piston rods can be removed at the center between the cylinders.

Details of the Gear

Referring to Fig. 1, which shows the valve gear applied to a trial engine in the shops of the National Transit Com-

pany, Oil City, Pa., the rod A is connected to a wrist plate which is driven from the main shaft by an eccentric in the same way as is the case with an ordinary steam engine. This

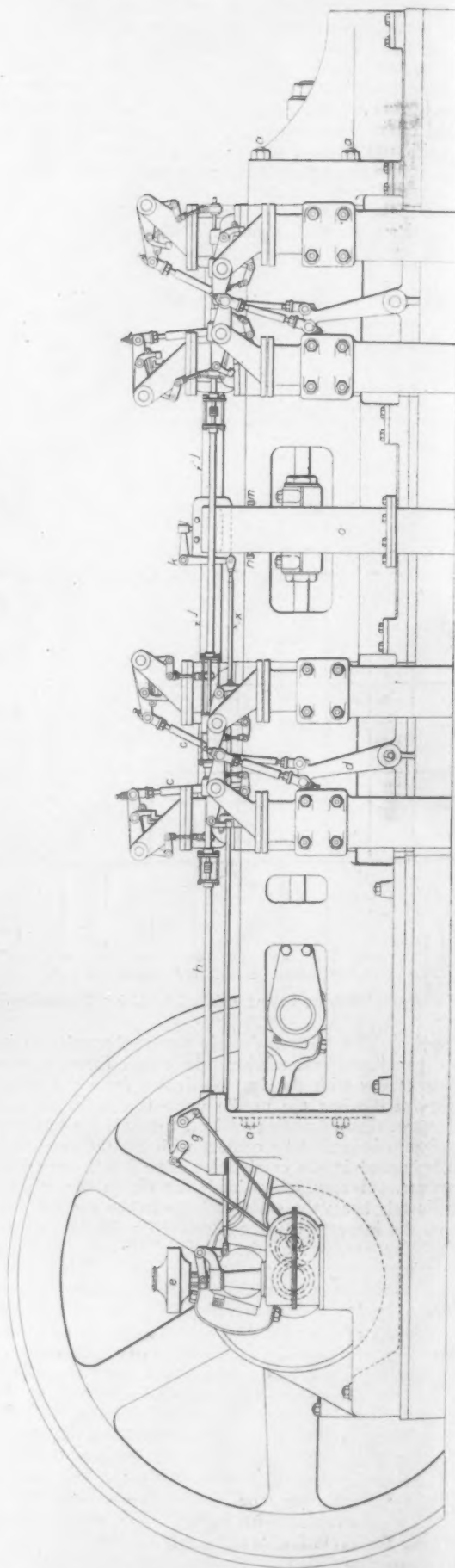


Fig. 2.—Details of the Application of the Gear to a Gas Engine.

rod is connected by a pin to the arm B, which is rigidly keyed to the shaft C. This shaft is rigidly keyed to the lever R, which has the hood D attached to it by the pin P, upon

which the hood D swings. The head of the valve stem J is rigidly connected to the valve, the valve spring being inclosed in the valve casing N. The timing rod F moves one stroke for each complete revolution of the crankshaft and is driven by a set of spur gears having a ratio of two to one. These gears have only to overcome friction so that they need not be large even on big engines. The timing rod F is connected to the hook D through the arm E, the link G, the bell crank H and the link I. The first two members of this train combine to exert a wrist plate action and cause the bell crank to dwell when the valve is being opened, thus preventing any slippage between the hook D and the valve-stem head J. On one end of the stroke of the timing rod F the hook is disengaged from the head of the stem so that the valve opens every other stroke. The engagement of the hook with the head of the valve stem is such that if the valve should tend to stick open it will be forced shut or nearly so, which causes the valve to close positively. In case temporary repairs have to be made it is claimed that all parts of the valve gear can be replaced overnight in a blacksmith shop and an ordinary drill press.

Referring to Fig. 2, which shows the application of the valve gear to an engine, a bearing on the foundation is secured for the engine throughout its entire length and breadth. The four tie bars terminating in nuts *a* pass through the entire engine and when they are set up all the cast iron parts are placed in compression, which gives a rigid engine and one which is said to be very stiff for its weight. The reverse side of the engine is plain except for the valve gear. There are two eccentrics on the main shaft which connect with rocker arms to line up with rods from wrist plates mounted on the shaft *b*. The inlet valve links

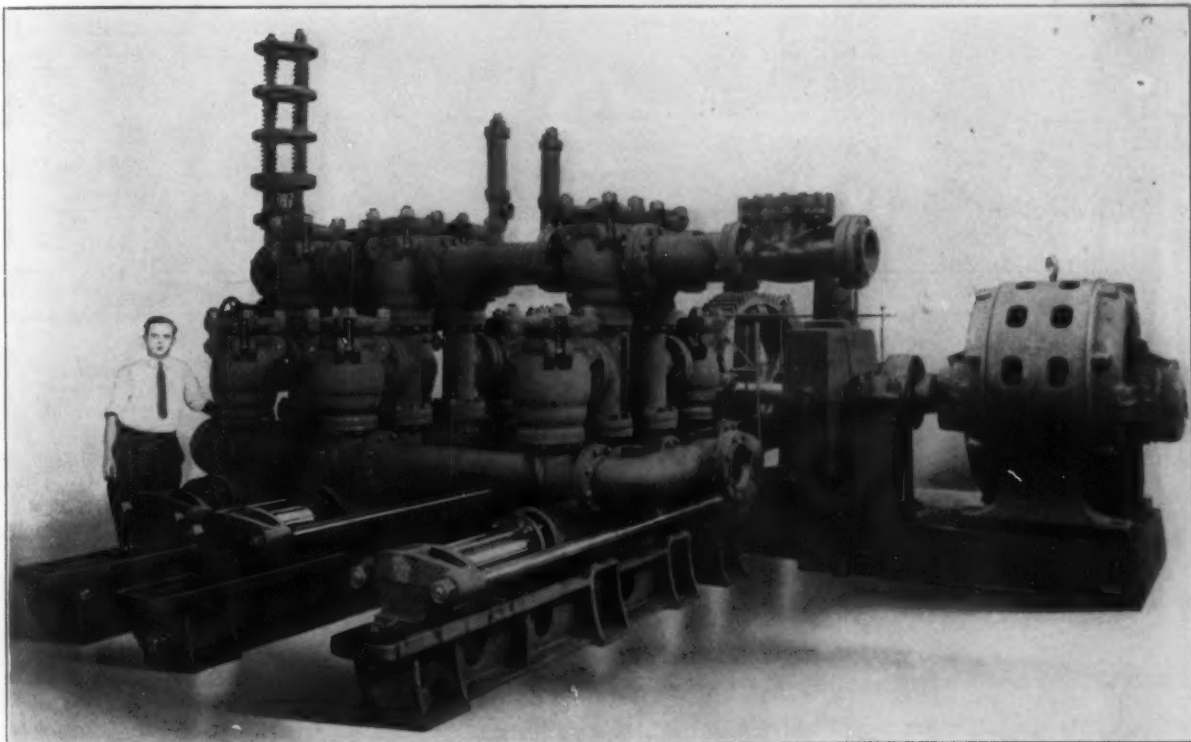
conducted to the cylinders through the pipe *j*, which is rectangular in cross section. The ignition is of the make and break type, the spark being furnished by an 80-volt electric current. Compressed air is used for starting the engine and auxiliary equipment is furnished to supply it.

As a result of the tests previously mentioned, the National Transit Company, Oil City, Pa., is building a 26 x 36 in. double-acting tandem gas engine directly connected to a 500-kw. generator to be equipped with this gear. This engine is to be used to drive the machinery in the shops of this company, which builds the engines and pumps used by the Standard Oil Company throughout the country.

Goulds Motor-Driven Mine Pump

What is said to be one of the largest motor-driven pumping equipments ever built for unwatering a mine was recently furnished by the Goulds Mfg. Company, Seneca Falls, N. Y., to the El Oro Mining & Railway Company, El Oro, Mexico. This installation affords an excellent illustration of the advantages of the electric-driven pump for mine service, since the flexibility of this equipment enables it to be installed and operated in any desired location regardless of the capacity required.

The construction of the pump is such that it can readily be dismantled and lowered down an ordinary mine shaft and when assembled it requires very little headroom. The pump is installed in the bottom of the mine and will pump against the head of 1300 ft. The cylinders are 6 in. in diameter and 20 in. long and the capacity of the equipment is 500 gal. per minute. The driving motor is a 200-hp. three-phase 50-cycle 440-volt constant



One of the Largest Motor-Driven Pumping Equipments for Unwatering a Mine Built by the Goulds Mfg. Company, Seneca Falls, N. Y.

c are connected to a wrist plate mounted loosely on this shaft. The exhaust wrist plate *d* is attached firmly to the shaft and is driven by a lever on the opposite side of the engine. A shaft having a connection with the main crank pin drives the governor *e* through bevel gears and also drives the timing eccentric *f* at half the speed of the engine. The box *g* incloses an arrangement of levers which drive the timing rods *h* in a reciprocating manner. The rear cylinder operates like the crank cylinder and the wrist plates are connected with a rod. The gas and the air forming the explosive mixture which furnishes the motive power are conducted separately in the divided pipe *o*, the amounts being controlled by the valves *m* and *n*. The gas and the air are mixed at the throttle valve *i*, which has a balance control from the governor through the lever *k* and the rod *x*. After leaving the throttle valve the mixture is

speed motor built by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. The normal speed of the motor armature is 485 r.p.m. and power is transmitted through a double reduction gear to the pump crank shaft, which operates at a speed of 35 r.p.m.

The Corrugated Bar Company announces that its headquarters will be removed October 14 from St. Louis, Mo., to Buffalo, N. Y., where it will occupy the third and fourth floors of the Mutual Life Building. The change in headquarters has been decided upon as the company's stock warehouse and fabricating plants are located near Buffalo, and customers can thus be given better and more prompt service in the handling of orders. District offices will be maintained in the National Bank of Commerce Building at St. Louis, as well as in New York and Chicago.

W. H. MESSENER & SONS.
Mechanical and Civil Engineers,
PITTSBURGH, PA.

The Panama Canal Cableways

An Interesting Study in the Efficiency of This Type of Machinery

The specifications for the cableways used in the construction of the Gatun locks and at other places of the Panama Canal called for the high speed of 1800 ft. per minute, which was about twice the speed obtainable from the carriers on the market at the time these specifications were issued. Together with this high speed it was imperative that the machines should work at the maximum efficiency with the smallest possible percentage of breakdowns, since on work involving the moving of so much material even the slightest delay is serious. It has been estimated, for example, that on the Gatun locks where the greatest number of cableways are installed the loss per minute for the time the cableways are out of service during working hours for repairs amounts to \$1.50. If each cableway were out of service 10 min. per day in a year of 300 working days, the total loss for the eight cableways installed at that point would amount to \$36,000. This includes the losses for labor, depreciation, interest and overhead charges.

The contract for the 13 cableways to be used on the

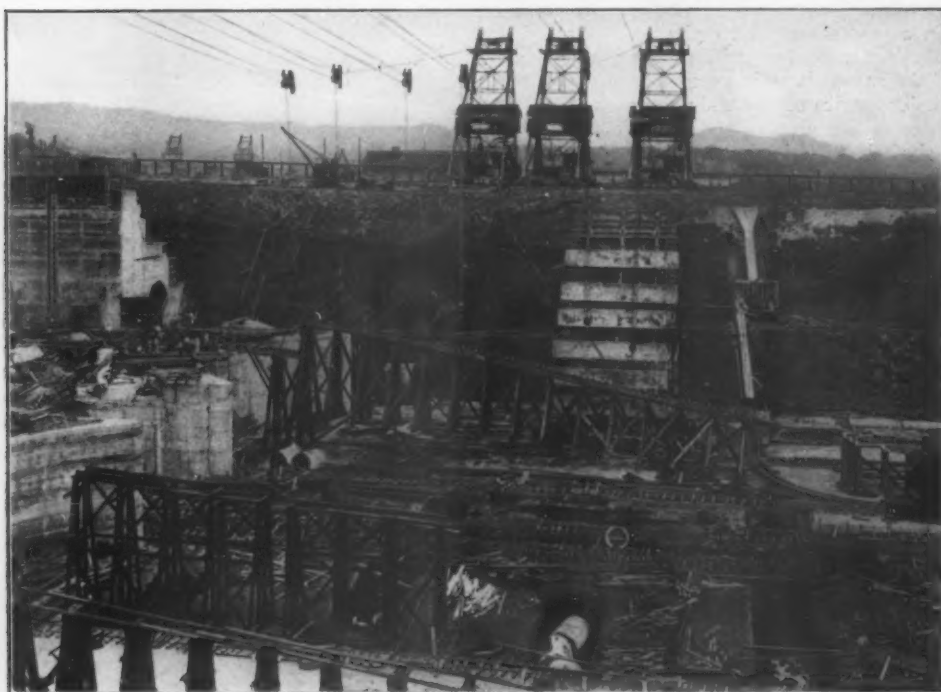


Fig. 1.—The Cableways Installed at the Gatun Locks for Transporting Material by the Lidgerwood Mfg. Company, New York, N. Y.

canal was awarded to the Lidgerwood Mfg. Company, 96 Liberty street, New York, N. Y. These machines have been in operation for approximately two years and have fulfilled the requirements as to speed with a high efficiency as regards breakdowns. In order to do this a new type of carrier had to be designed that involved a number of detail changes all tending both to increase the speed and to decrease the wear and breakage. A view of the Gatun lock showing these cableways in use for transmitting material is given in Fig. 1, while Fig. 4 illustrates the new type of carriage designed for the high speed cableways installed on the Isthmus. The construction of the buttons is shown in Fig. 2, while Fig. 3 is a section through the button after being installed on the cable.

The standard design of Lidgerwood cableway had a

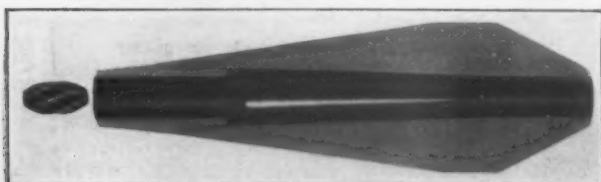


Fig. 2.—Section Through the Button.

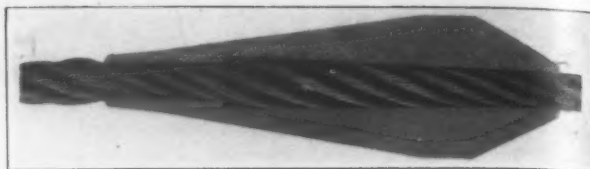


Fig. 3.—Section Through the Button on the Cable.

fall-rope carrier in which the carriage ran on a main cable and was moved in either direction by haul ropes. The fall was operated by a fall rope which was kept approximately parallel to the main cable by a series of carriers that were spaced on a button-rope cable and were picked off the main carriage by buttons fastened at intervals along this rope. Formerly these carriers hung on a horn at one end of the carriage and were provided at the upper end with slots of graded sizes corresponding to the dimension of the buttons so that each button would pass through every carrier except the one that was intended to be pulled off the horn. In this way the carriage ran all along the cable, the fall rope was kept from the natural sagging that would prevent the operation of the fall and as the carriage returned toward the engine the carriers were picked up successively by the horn on its way back.

These machines worked fairly well up to a speed of 800 ft. per minute, but above that the repair losses were very great. The form of the button, the manner in which it was held in place on the button rope, and the shape of the carrier heads which collided with the buttons all seemed to contribute to this difficulty. The buttons entered wedge-like into an opening in the carrier heads which were slotted in forged steel, but no matter how heavy the heads were made the impact effect seemed to increase in proportion to the weight, and the wedge-like action of the buttons split the heads. The impact on the buttons was also destructive to the button ropes, which had to be renewed frequently. This type of button was

made in halves, divided lengthwise and screwed together. It inclosed a pair of spreaders put into the rope and a babbitt metal bulge cast around the rope within the button. The surface of the rope which received the shock was so small that the wire was soon cut and the ropes destroyed.

Improvements in the New Cableways

The capacities specified for the cableways for the canal necessitated load carriage speeds of 1800 ft. per minute and this made improvements in the old type imperative. In designing these cableways improvements were made in the buttons, the fall rope carrier and the carriage itself. Instead of making the button in two pieces as formerly, it is now a single steel forging bored out with a long tapering recess, as illustrated in Fig. 2. To make the rope fit this recess for its entire length a tapered steel pin which is shown in the recess in the middle of the button is inserted instead of the hemp center. In this way a bearing of ample area is secured to receive the shock from the carrier and eliminates the tendency to cut the rope. A follower which is shown at the left end of the button fits into the open end and serves to finish its contour. A small spreader shown detached at the extreme left is inserted in the rope back of this follower as shown in Fig. 3 and holds the button in place. This type of button and the rope

carrying it have withstood a series of tests extending over a number of months at the company's testing station where the carriage speeds have been as high as 3000 ft. per minute for a considerable length of time.

The form of the fall rope carrier head, Fig. 4, was the next point to receive attention. Its design was changed from a slotted head to the form of a steel eye which, as it comes into contact with the end of the button around almost the entire circumference instead of at two points only, eliminates the tendency of the button to split. Another advantage of this arrangement is that, since the eye weighs but about one-tenth as much as the slotted head, a considerable saving in the weight is secured. Another arrangement which absorbed a considerable part of the shock which formerly took place was the hanging of the eye in the carrier so that it was free to swing when it was picked off the carriage. The introduction of a second joint in the carrier head below the eye resulted in such a thorough absorption of the shock that even at speeds as high as 2000 ft. per minute no destructive effect was said to have been apparent.

The last improvement of importance was made in the carriage and followed and was incidental to the other two

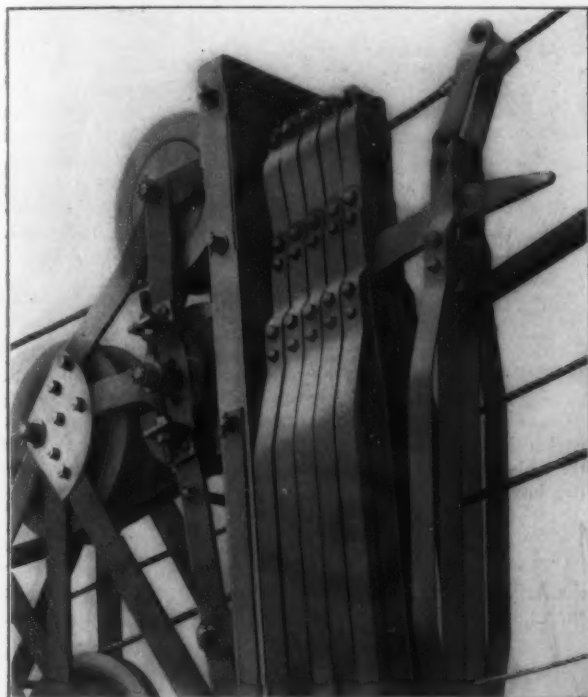


Fig. 4.—The New Cableway Carriage.

changes. As will be noticed by referring to Fig. 4 the horn which carries the fall rope carriers out to the buttons and picks them up again upon the return trip of the carriage is mounted separately on the main cable and has a wheel which is entirely independent of those holding the carriage. A pivoted connection joins the horn mounting to the carriage in such a way that the horn and the cable are always parallel regardless of what the curve of the latter may be. In this way, it is pointed out, the carriers are picked up positively and with very little shock as the horn enters them at the same point each time. There are three bearing wheels on the main cable for the carriage proper, and two of these are mounted in a pivoted bearing so that they can adjust themselves to the varying curves of the cable. In this way the weight and the wear are distributed equally between these two wheels, an arrangement which contributes, it is said, very materially to the life of the main cable. The increase in the economical speeds of the load carriage from 800 or 900 ft. per minute to 1600 or 1800 ft. has approximately doubled the capacity of the cableways.

Reports received from the canal state that the eight cableways used placing concrete in the locks have been out of service for repairs of all kinds but 1 per cent. of the total working time for nearly a year's continuous use. This is based on a working day of 10½ hr. and a loss of 7½ min. per day. An interesting contrast between the efficiency of the old and new types of cableways is afforded

by comparing the performance of the machines installed on the Chicago Drainage Canal, which was the largest single operation where cableways were employed. In this installation the 20 old-style cableways for the first few months showed an average loss for repairs during working hours of approximately 45 min. per 10-hr. day each, but this was later somewhat reduced. On the basis of the Panama report this would give a difference in efficiency of 6½ per cent. in favor of the Panama cableways, or, reduced to dollars and cents, the cableways at the Isthmus have an actual earning capacity of \$20,250 a year apiece over those used for the drainage canal.

The Sale of French Panama Scrap Material

Referring to the sale to the Chicago House Wrecking Company, for \$215,000, of all French equipment and scrap metal in the Canal Zone that has not been taken into stock for use, or is not already in use, the Canal Record says:

The successful bidder agrees to pay an arbitrary rate of \$8 a ton on the issuance of bills of lading until the total price is paid. Included in the material sold are a number of old locomotives, dredges, excavators, dump cars, boilers, cranes, cylinders, 30 and 35-lb. steel rails, scrap iron, copper and brass. It must be taken by the contractor from the places where it has been collected, or where it was abandoned by the French, and transported to the seaboard at his expense. A rate of \$2.25 per net ton will be given by the Panama Railroad for transportation to either Colon or Balboa. Most of the material that was in the Gatun Lake region has been removed, but there still remain some excavators at Tabernilla and some miscellaneous equipment at Bohio, which must be removed by the contractor before the water covers it, or be a loss. None of this material is in the canal prism.

A statement of the net value of the French scrap sold up to July 1, 1911, is in preparation in the office of the examiner of accounts, and, until that is available, the exact value to the government cannot be given. Approximately, one million dollars' worth of the material has been applied in canal construction, however, and there have been sold in the States as scrap 17,537.23 gross tons at an average price of \$11.86 per ton.

The Connellsville Coke Trade

The Weekly Courier, Connellsville, Pa., reports conditions in the region as follows:

The Connellsville coke trade last week did not maintain its record of the week before, showing a loss in both production and shipments of close to 3,500 tons. With all contracting for furnace coke for this year practically closed, and no expectation that the furnace capacity will be increased in the near future, indications are that there will be little change in the operation of the furnace ovens for the remainder of the year.

While the foundries are taking full shipments on contract coke, the demand for prompt foundry is light, and on account of some cutting by dissatisfied and presumably needy producers, prices have suffered a shade. As a consequence, good grades of foundry coke are now quoted at from \$1.80 to \$1.90 per net ton at oven, as compared with the former quotation of \$1.85 to \$2.

Production last week was 313,652 tons, as against 317,055 tons. The loss was entirely with the furnace ovens, their total being 176,676 tons as compared with 180,066 tons, a decrease of 3,390 tons. The total number of ovens in operation was 26,034, being increased by the firing of 10 ovens at Acme, 20 at Mt. Hope and two scattering, and decreased by the blowing out of 15 at the Semet-Solvay plant, making a net increase of 17 ovens.

The total number of ovens in the region was increased by the addition of 30 ovens at various plants.

The light-hearted manner in which dissolution suits are planned against large manufacturing concerns, says the Wall Street Journal, displays the popular attitude toward our foreign trade. Brag of the exports, but curse the exporters.

The Aligning of Shafting*

Methods and Results in Reducing Friction Losses in Machinery Drives

BY GEORGE W. LOGGIE.

A very careful investigation and numerous tests establish that the average loss of power due to friction in shafting is about 35 per cent., a startling fact. It is a very common experience to find in these plants friction loads of 40 to 42 per cent. The friction is not altogether due to the shafting, that is, the pressure at the boxes, but is also due to the tension of the belts.

A few up-to-date plants use a transit or architect's level instead of the spirit level to obtain their leveling line. It is a fact conclusively proved that no line over 50 ft. in length can be accurately adjusted by this method. Where this method has been used on lines 150 ft. or over a variation of $1\frac{1}{4}$ in. in level and alignment has been found, and a variation of $\frac{1}{2}$ in. is very common. This is not due to the carelessness of the mechanic or millwright, as one might quickly suppose, for with this method the cleverest millwright living could not do a perfect job. The very smallest variation found out of hundreds of tests on long lines has been $\frac{1}{8}$ in., and this is considered a real good job.

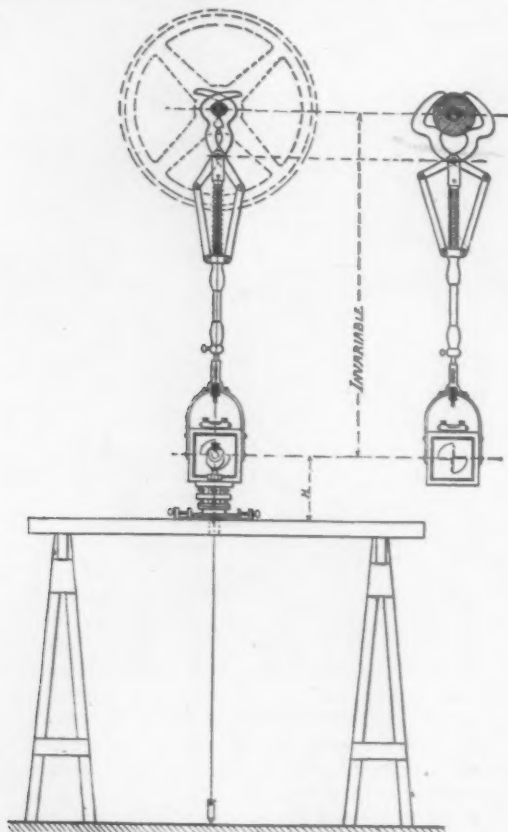


Fig. 1.—Portable Target for Shafting of Different Sizes.

The fault is not with the millwright, but with the tool; a perfect job is an impossibility under this method. This explains clearly why the standard of friction—that of 35 per cent. quoted above—is accepted to-day, and this is really an excellent average. A very great majority of mills will exceed this average. Where this average is maintained good work has been done by the millwrights.

To align and level shafting with such perfect accuracy that what was considered a fair friction load, namely, 35 per cent., is now considered extremely excessive. Using the device here described the new standard calls for a friction load of not over 20 per cent. This is a safe and conservative figure, for we could claim a standard of 15 per cent. and maintain it. This low standard, however, involves not only close to ideal conditions in the plant, but such an arrangement of machines, pulleys and belting, together with such personal supervision, as perhaps it would be unreasonable to expect. With this device any shafting of whatever

length and of varying sizes irrespective of the location of the shaft and the obstructions under or around it can be so adjusted that the boxes will bear perfect relation to

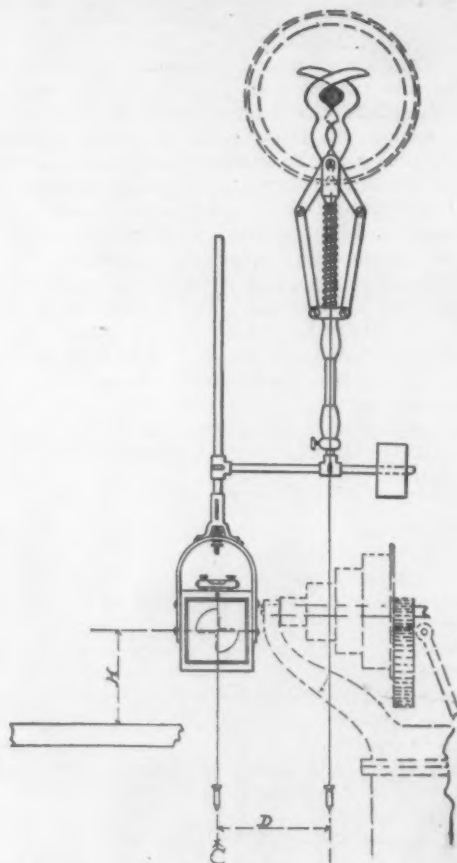


Fig. 2.—Use of Portable Target with Offset.

each other, all pressure on the shafting being removed and the only cause of friction being the weight of the shaft in the box and the pull of the belt.

The New Device

The device includes a special architect's level built particularly for indoor and shafting work, a self-centering target, which is hung from the shafting by an ingenious

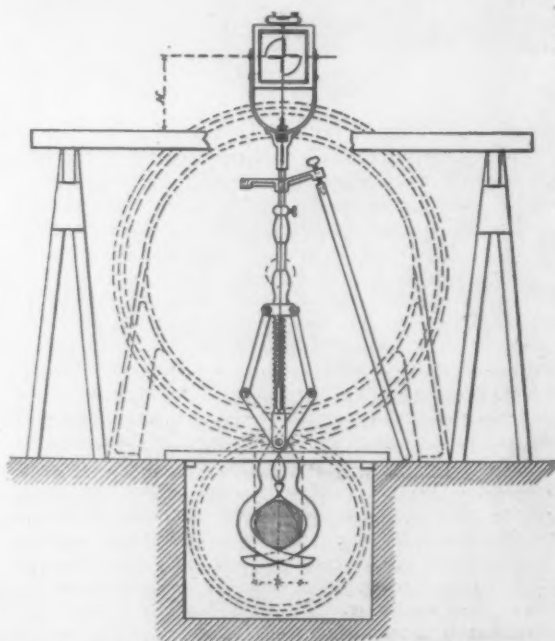


Fig. 3.—Portable Target Over Pit Shafting.

jaw clamp so constructed that it not only invariably finds the center of the shafting but remains invariable irrespective of the change in size of the shafting and variations

*From a paper read before the National Association of Cotton Manufacturers, Manchester, Vt., September 27-30.

due to change in diameter (Fig. 1) and a fixed or stationary target used as a check to insure uniform readings. The portable or moving target is capable of such arrangements and adjustments as to enable the operator to work on any of the various kinds and positions of shafting. The portable target and the back target are both transparent. A magnifying lamp is used for night work, making it unnecessary to light up the factory.

Fig. 2 shows the fundamental principle of using the target with offset for the purpose of getting around an obstruction, whether a machine or belt. Various arrangements of this offset feature will enable the operator to overcome any condition or obstruction he may find. Fig. 3 shows the method of adjusting the target on shafting which is in a pit or on the floor. Fig. 4 shows a very common arrangement where the shafting runs under tables or benches. It is really a simple offset arrangement.

The merit of this system is based upon the portable target and its centering features because of its invariable relation to the line of the shaft. Each reading presents the actual condition of the hanger, both as regards the alignment and level, at one operation. The crosshairs of the architect's level showing on the face of the target indicate the true position, whether the shafting is high or low or out of alignment. The boxes can be adjusted to 0.01 in. if desired and a reading of any length shafting can be made. All arrangements of the targets provide for the accurate locating of the engineer's level in positions convenient to the operator. The method is simple, absolutely accurate and economical; so simple that any ordinary millwright can use it, so accurate as to insure the reducing of an ordinary friction load anywhere from 10 to 50 per cent., and so economical as to enable two men to do in an hour's time, whether night or day, more actual work than four men can do in four hours' time under the old method.

Another interesting and unique feature of the outfit is that with it shafting in motion can be aligned accurately. In one case of shafting at a speed of 185 r.p.m. neither the architect's level nor portable target was affected in the least by vibration or the running of the shafting, and an absolutely perfect reading was secured. While it is advisable at all times to align shafting when not in motion, it is nevertheless true that a perfect operation can be secured even though the shafting is in use. The only thing that will affect the reading would be the vibration from the floor or ceiling, which would make it difficult to get an absolute reading of the architect's level.

Results of Shaft Aligning*

In a plant in Worcester, Mass., is a main line shaft 226 ft. long in the basement. The main drive was on one end, the shafting passing through four brick walls. It was impossible to align it from end to end by any other method than that employed. Setting up the instruments a reading was taken, showing a sag of $2\frac{1}{4}$ in. in about 25 ft. Investigation showed the fact that about eight months previous there had been an accident to the building, when temporary repairs had been made, but inaccessibility and a pressure of business furnished the excuse for setting up the shaft temporarily in what proved to be a dangerous position.

In a factory in New Bedford, Mass., a main line ran over cross-beams of trusses 22 ft. from the floor. The shafting also went through one brick wall. An engine indicator card revealed a very decided increase in friction, which ultimately resulted in the blowing out of a cylinder. The line was 250 ft. long, ranging from 2 3-16 in. to 6 3-16 in. in diameter, and had not been aligned for several years. A reading was taken in two hours, showing a variation of $2\frac{1}{4}$ in. What would ordinarily have been at least a two days' job under any other method—and a most imperfect one on account of conditions—was accomplished on a Saturday with entirely satisfactory results and a decided decrease in friction.

A shaft 120 ft. long, running in roller-bearer hangers driven by motor, was aligned and leveled in two hours' time, and a second reading immediately taken on the motor showed a yearly saving figured by the superintendent as about \$20. The result was that every shaft in this plant was immediately gone over—some 5000 ft. in all—and a saving of approximately \$900 per year was shown. The incident also revealed to the superintendent the mistake in the placing of the machines and the necessity of a counter-

shaft. In this, as in every other case, a reading of the shafting was taken before actual work was done, and in this particular plant, instructions were given the millwright

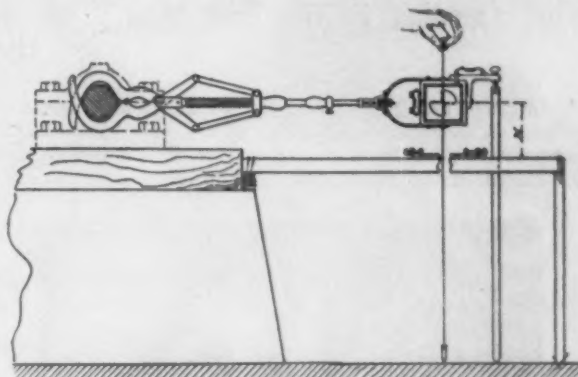


Fig. 4.—Target Used with Shafting Under Benches.

that readings of the various shafts were to be placed in the superintendent's hands monthly, which ultimately resulted in the shafting being gone over every three months.

In another case 2510 ft. of shafting of 23 different lengths, the shortest length being 32 ft. and the longest 360 ft., were aligned and leveled in 52 hr., working evenings, and for the first time in the history of this plant it was not necessary to shut down a department or lose a minute's running time. Never more than three men worked on the job, and most evenings but two. Before the work of aligning was done, the total load was 307 hp., of which 113 hp. was charged to friction, showing a friction load of 36.8 per cent., 1.8 per cent. above what was considered normal. Within 5 hr. after the work was completed, a second reading was taken to determine the saving, if any, and at this time the friction load showed 93 hp., which was 25.5 per cent. of the total load, a saving on the 2510 ft. of shafting of 20 hp. Since this chart was taken in this particular case a further saving has been shown. It was admitted that the saving in power would amount to about \$1100 a year.

In Waterbury, Conn., a test was made on a 3 15/16-in. shafting, 85 ft. long. A reading showed consumption of 10 hp. Competent millwrights aligned the shaft, using the old method of a silk string and spirit level, and a second reading showed improved alignment and a reduction of $2\frac{1}{2}$ hp., the shaft consuming $7\frac{1}{2}$ hp. The shaft was immediately aligned and leveled with our device and left in an absolutely perfect condition. The third reading showed the shaft consuming 4 hp., a saving of $3\frac{1}{2}$ hp. over the old method. The shaft had been lined up about a year earlier.

It is a common policy that belts should be removed when shafting is aligned. It has been clearly proved that this is an error; that all shafts should be aligned and leveled with the belts in place. A tight belt would very naturally pull a shafting over, and the removing of that belt causes a natural rebound in the shaft. Were the shaft aligned with the belts removed the alignment would immediately be thrown out by the putting on of the belts, whereas if the shafting was surveyed with all belts on an adjustment would be secured as near as was possible to secure it, to the running line.

If I were asked to state in concrete, simple terms what the difference in friction is between a scientific accurate surveying of shafting and the method ordinarily used, I should say it is at least 1 hp. to every 100 ft. of shafting. The day is coming—if it has not already arrived—and it has arrived to a good many—when this question of friction and vibration is to receive a great deal more thought and attention than it has heretofore, for we are beginning to realize the tremendous waste due to friction on shafting and machines, which friction can be very largely removed.

The American Railway Association's latest bulletin gives the total number of idle cars in the United States and Canada on September 27 as 50,038, which represents a decrease of 14,245 in the preceding two weeks. The decrease in the number of idle box cars was 10,200.

*Abstracted from a considerable number offered by the author, accompanied with diagrams of the shafting arrangement.

New Open-Hearth Furnace Construction

One Opening in the End Wall, That for Gas, While Air Enters Steeply Through the Roof

* In *Stahl und Eisen*, Vol. 31, No. 28, is an interesting article on new developments in open-hearth furnace construction, well illustrated, and written by Chief Engineer F. Bernhardt of Königshütte. The changes he describes



Fig. 1.—Arrangement of 17-Ton Open Hearth Furnace for Admitting Air Through Openings in Air Box and Roof.

have already been tested practically. The new construction removes entirely the so-called furnace head of the old construction. The chief characteristic is that the air is brought up over the end wall to an air box that rests, independent of the furnace, on the steel framework. The air enters the furnace through openings in the air box

other and the end wall, and suitable provisions are made to allow of expansion and contraction. Air box, gas flue and air flues are easily changeable, and consist of an angle iron framework and one thickness of brick. Through their separate construction they are accessible on all sides and well cooled by the outside air. Also the whole end wall of the furnace is free, so that it is air cooled, and any necessary repairs can be readily made. The chief advantage of this arrangement is that the troublesome tongue between the air and gas ports, an essential part of the old construction, is entirely done away with. This part soon burns back and changes the meeting point of the gas and air. The coal consumption increases, the efficiency of the gas is decreased, and the charge takes a longer time. The length of flame is shortened and the furnace roof is attacked. The air port becomes larger and the gas port smaller, so that the proportion of air to gas becomes too great, and this has an important influence on the quality of the steel.

Drawbacks of the Ordinary Construction

It is a common occurrence in the ordinary style of furnace that only after making a number of heats is the normal time per heat reached; and on the other hand many times the first heat is the best, and the furnace gets gradually worse as the ports burn back. Mr. Bernhardt's experience with the old construction was that, with a furnace making 450 to 500 heats, after about 300 heats the best grades of very soft steel could not be made. The product was red short.

In the new construction the end wall has only one opening, that for the gas, and the air enters very steeply through the roof. In this way the gas and air meet always at the same place. A very intimate mixture of gas and air takes place near the end wall; the flame covers the whole width of the bath and flows along its whole length. In this way the charge is melted and refined noticeably quicker than in the old style furnace, where the gas and air often do not thoroughly mix until half way across. This, of course, means very ununiform heating, the steel at the incoming end often being cooled down.

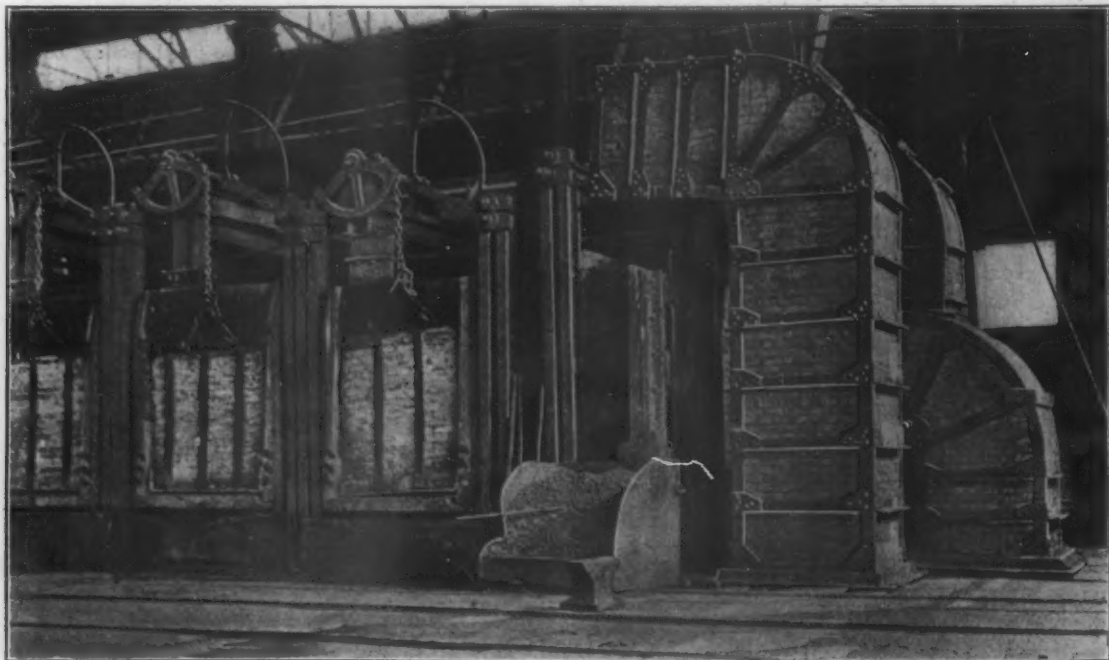


Fig. 2.—The New Arrangement as Applied to a 40-Ton Furnace.

and the roof. The air box can be so arranged as to admit the air at any inclination downwards, even vertically.

The gas and air flues are built independently of each

When the end wall is burnt back in a funnel shape the proportions of gas and air with the new construction are hardly changed. The chemical influence of the flame

on the bath remains, therefore, always the same. Through the thorough mixing near the end the gas burns almost completely in the furnace, and not, as in the old construction, mostly against the outgoing ports. The end walls and roof are therefore much less exposed to destructive influences.

great deal of refractory material. The tearing down of the furnace can be begun immediately after tapping. The air box, gas and air flues can be removed by the crane, the flues from the checkers, coming to the working floor, being covered with a plate to prevent loss of heat. In a large plant the number of reserve furnaces can be reduced.

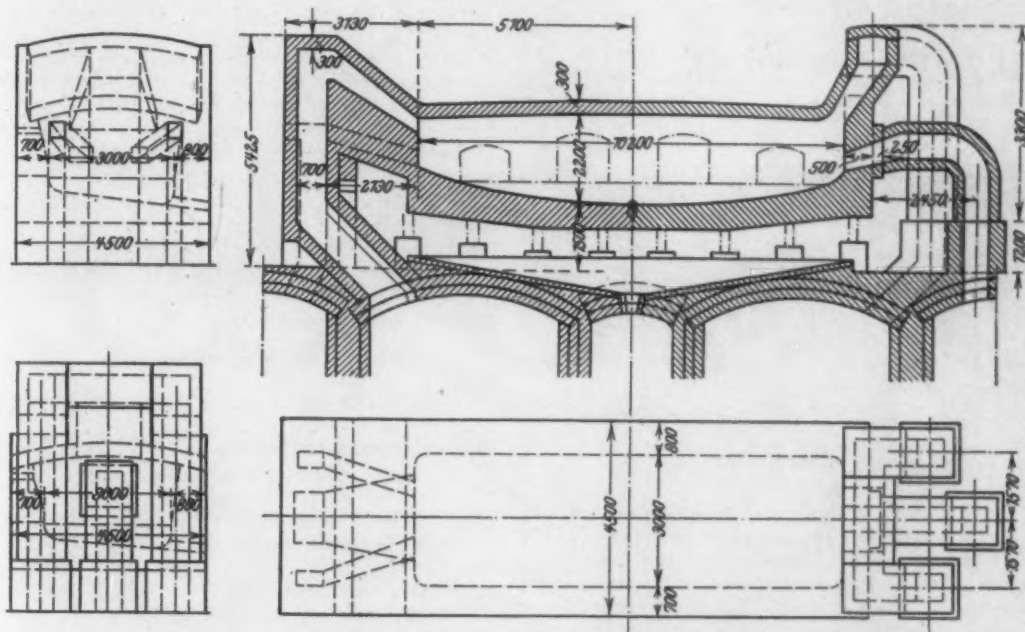


Fig. 3.—Plan and Section of 40-Ton Open Hearth Furnace. The New Arrangement is Shown on the Right-Hand Side of the Furnace and the Old Arrangement on the Left. Dimensions in Millimeters.

The inside of the end walls with its perfectly flat surface and only one opening offers very few points of attack and suffers less in consequence. Because of their thinness and free exposure the end walls are also very efficiently air cooled. Further advantages of the new construction lie in the simple construction of the whole furnace. Through the separate nature of the gas and air flues, the real body of the furnace is considerably shortened. Also because of the very effective flame production it may be further shortened and widened and still have the same or even

The First Experimental Furnace

The new construction has been tried for a considerable time at Königshütte on three furnaces and the results were better than expected. The first experiment was made on a 17-ton furnace. On the right side the old ports were left in and on the other the new construction was built, to observe the different effect. The appearance of the new construction is shown in Fig. 1. The air box extends the whole width of the furnace and is supported on brackets resting on the steel framework. The air and gas flues and

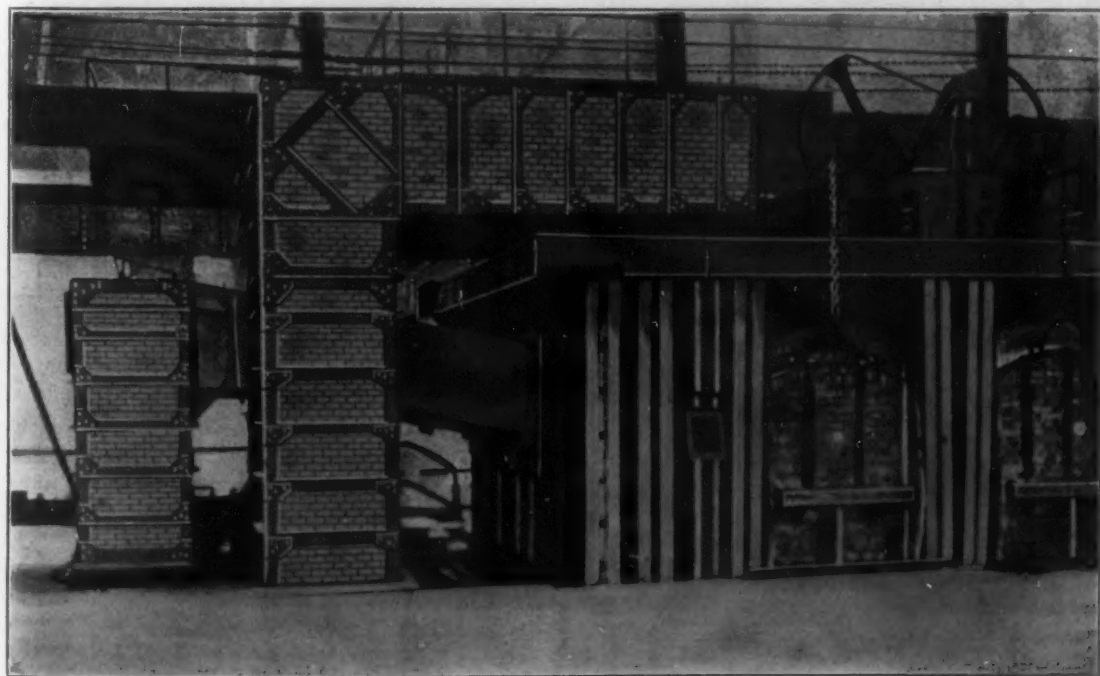


Fig. 4.—The Air Box as Applied to the Second 40-Ton Furnace.

greater capacity. The steel framework will be lighter and simpler, and the roof will have greater durability.

Repairs and the tearing down of such a furnace can be done in a very short time. The air box is easily changeable, and the rebuilding of the thin end walls and the short simple roof ought to take only a few days and not use a

the air box are of one brick thickness. The air enters the furnace at an angle of 62 deg.

The furnace was put in use August 23, 1910. After 130 heats the right end wall needed repairing. After 306 heats, on November 29, 1910, the furnace was stopped and rebuilt because the right furnace head was badly burnt.

Opportunity was taken to thoroughly rebuild the right half of the furnace, and slight repairs were made to the air box on the left side.

On January 2, 1911, the furnace was again put in use and on April 13, 1911, after 324 heats, a total of 630 heats,

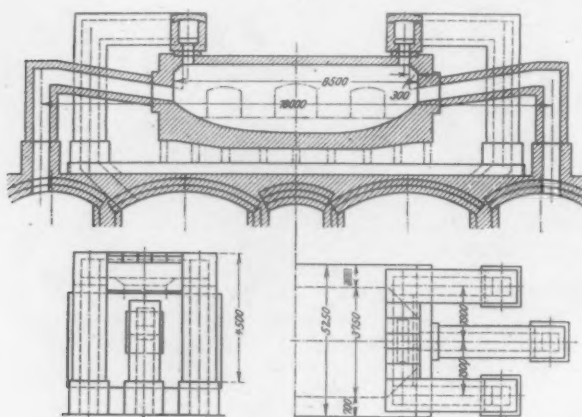


Fig. 5.—Section and Plan Showing New Arrangement on Second 40-Ton Furnace.

was shut down. The left side could easily have stood two or three weeks more, but on the right side the checker work was filled with slag. The usual end wall repairs on the right side were not necessary until March 9, 1911, after 244 heats, which was exceptional. This was a proof of the complete combustion of the gas and air entering from the left side.

After putting in use, the furnace took about a week to give the best results; then it was noticed that the left side was superior to the right side, for the charge was melted at least 30 minutes earlier on that side. This influence extended fully two-thirds of the length of the furnace. The furnace men made use of this by placing the charge at the left side of the furnace as much as possible. After a certain time the right side improved, but the left side remained superior and constant. Corresponding to these results the time per charge was 6 hours at the beginning, then for a time $5\frac{1}{2}$ hours, and at the end of the run again 6 hours.

A Change in the Air Box

The second test was made on a 40-ton furnace. When both ends of the furnace were built alike. The arrangement is shown in Figs. 2 and 3. The left side of Fig. 3 shows the old construction, and the right side the new one. The chief departure in this arrangement from that for the 17-ton furnace was that the part of the air box between the two air flues was made simpler and easier to change. This is the part that was attacked the most strongly. The air enters the furnace at 52 deg. The cross section of the gas and air ports remains carefully the same as in the old construction. The furnace has been constantly in use since January 16, 1911, and had made up to the time of the article 346 heats. After 282 heats, on April 10, the first Sunday repairing was done. It consisted of repairs to the roof over the end walls and to the air box. This repair work was rather troublesome, because the rather poor choice of reinforcement for the air box prevented proper air cooling, and led to its destruction. Maintaining the same areas for the gas and air, as in the old construction, made such an active flame that the furnace got too hot, and the brickwork was attacked more or less. The weekly output increased from 24 to 27 heats. When the furnace is torn down the areas will be reduced, and it will also be possible to reduce the dimensions of the checkers.

Angular Instead of Curved Flues

The third test is also being made on a 40-ton furnace. It is illustrated in Figs. 4 and 5. The difference from the second installation are that the gas and air flues are angular instead of curved, and the air enters the furnace vertically. The hearth is made shorter and wider. As may be seen in the drawing the end wall springs in an arch for twelve in. (300 m.m.) before it is cut by the air entrance. The object of this is to gain data for the best position of the air entrance. The furnace had only been in use for a few days, so that no conclusions could be given. The flame

formation is good, but 90 deg. appears to be too steep an angle, because too many of the waste gases go through the gas entrance.

From the tests made so far, it is estimated that the gas and air flues will stand 1500 to 1800 heats. The end walls and air box will stand from 280 to 330 heats, and the life of the roof is increased at least 50 per cent. This leads in Germany to a direct saving of 19 cents per ton of steel, and does not take into consideration the simple furnace construction, as well as the favorable influence on the quality of the steel. With further development this figure ought to be increased. From the tests it may be concluded that the air box extending the whole width of the furnace is the most practical.

The remainder of the paper takes up various proposed modifications, and the application of this principle to tilting furnaces and mixers. It concludes with the description of a proposed slag pocket, the floor of which is level with the working floor and into which a suitable car may be placed for catching the slag.

G. B. W.

Decision on Gas Producer Operation

Doherty Process and Apparatus for Prevention of Clinkering and for Fuel Saving Upheld

A decision on gas producer operation has been handed down by Judge Brown, of the United States Circuit Court of Massachusetts in favor of the complainant in the case of the Combustion Utilities Corporation versus the Worcester Gas Light Company, Worcester, Mass. About three years ago it was claimed that the Doherty patents were infringed by a prominent builder of gas benches for the Worcester Gas Light Company. Suit was brought against the gas company by the Combustion Utilities Corporation as owner of the Doherty patents.

Mr. Doherty's invention does away with the use of water and steam for regulating the temperature of combustion and preventing clinkers and consists of a process of employing a decomposable gas, preferably carbon dioxide, mixed with air. It has for its object not only the regulation of combustion and prevention of clinkers, but also a considerable reduction in the amount of fuel required to obtain a given result. The mixture of carbon dioxide and oxygen should be introduced to the fuel bed at such a temperature and the proportions of carbon dioxide, free oxygen and free nitrogen should be such that the fuel bed is kept below the temperature at which clinkers occur, heat being given up to the gases from the fuel bed.

Among the citations as set forth by the defense as indicating anticipation in the prior art were United States and foreign patents covering the return of part of the products of combustion to the producer for the purpose of utilizing what would otherwise be waste heat; also processes for smokeless operation of furnaces by burning the free carbon in the waste gases to colorless carbon dioxide; also a process for the production of a long rolling flame suitable for lime-kiln operation by returning a portion of the waste products of combustion to the space beneath the grate bars of a furnace. The court held, however, that these patents had for their object something entirely distinct and different from the fundamental bases of the Doherty patents, which were the regulation and control of combustion.

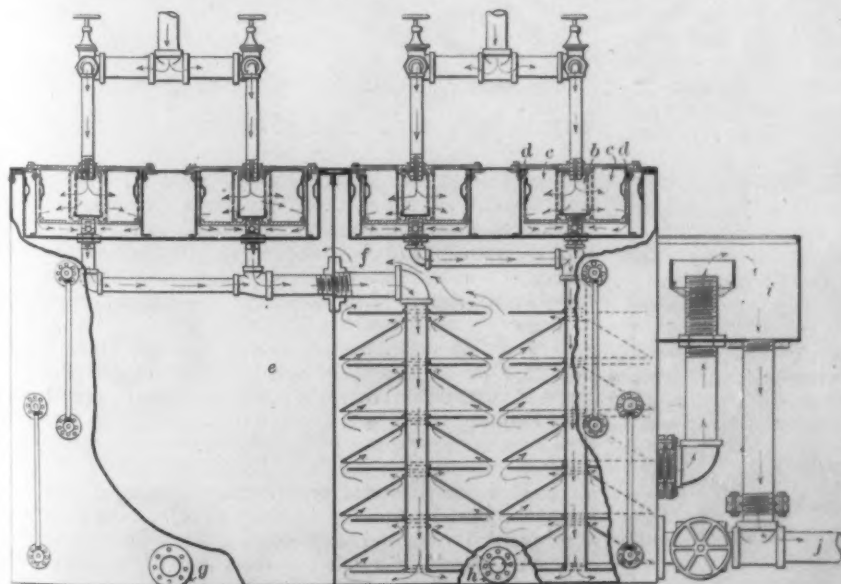
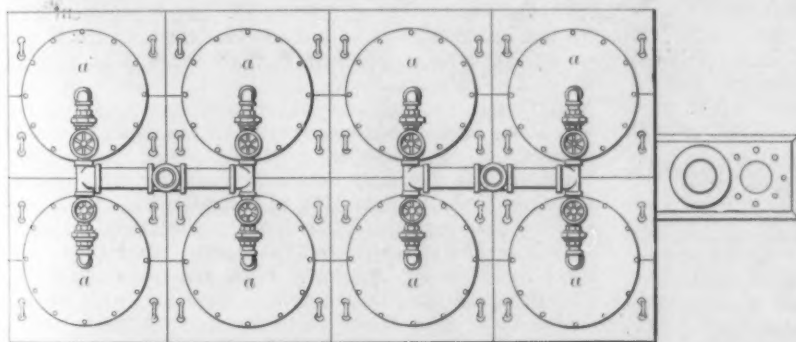
The Doherty apparatus patent was also held by the court as having been infringed. The patent has to do with the means and methods employed to regulate the mixture of air and diluent gases.

The Linton Trust Company, Linton, Ind., has been appointed receiver for the Indiana Steel & Iron Company, on petition of the Linton Rolling Mill Company. The rolling mill had been idle for about two years, when, early this year, a stranger from Pittsburgh induced the leading business men of Linton to raise \$10,000 to start the mill in operation again, he to put in \$30,000. A new corporation was formed and the property of the old one conveyed to it. The promoter left for Pittsburgh and did not return. The court is now asked to declare the conveyance void and to transfer the property back to the rolling mill company.

The New Burt Oil Filter

Size is the especially interesting feature of a new pressure oil filter which has recently been developed by the Burt Mfg. Company, Akron, Ohio. The capacity of this new filter, which is designed for use in street railway power houses and other large power plants, is 100 gal. per minute, and in addition to filtering the oil, space is provided for storing 500 gal. of purified oil. A plan view and an elevation of the filter are given in the accompanying engraving.

In use the dirty oil is first collected in a settling tank and pumped from there under pressure to the filter. It is delivered through pipes to a battery of eight filtering cylinders. Upon entering one of these filtering cylinders, *a*, the oil passes into a fine screen cylinder having a removable sediment pan, *b*, at the base, to facilitate cleaning. From there passes through a cylinder, *c*, filled with animal bone black and then through a ply of filtering cloth, *d*. Upon leaving the filtering cylinder the oil flows down one of the tubes to the bottom of the filter and into the washing and cooling compartment. It bubbles up through the water in this compartment, passing around baffle plates that make the distance the oil travels by the time it reaches the top 10 ft., and when it has completed its course, which is clearly indicated by arrows, it has become thoroughly washed and cooled. When the oil reaches the top of the cooling compartment it is discharged directly into the pure oil reservoir *e* through the overflow *f*. From this reservoir the oil is pumped through a 2½-in. outlet, *g*, either directly into the system or to an overhead oil reservoir having a capacity of 500 gals., from which it flows back to the bearings and the same filtering operation is performed over and over. Each filtering cylinder is independent of the others and one or more can be cleaned



An Improved Type of Pressure Oil Filter for Large Power Plants Made by the Burt Mfg. Company, Akron, Ohio.

at any time without interfering with the oiling system by simply closing the valves corresponding to the cylinders which are to be put out of commission.

The water for cooling the oil is supplied to the filter constantly through a 2-in. outlet, *h*, at the bottom, and

is discharged through the automatic water separator *i*. The water separator is lower than the discharge into the pure oil reservoir, and thus it carries off the water which runs through a 4-in. pipe, *j*, into the sewer. If for any reason it is desired to economize in the amount of water used, it can be run into a cooling tank and pumped from there back into the filter. Any water that is brought to the filter by the used lubricant is automatically removed by the water separator. The quantity of cold water that is allowed to pass into the filter regulates the temperature of the oil, while if it is desired to heat the lubricant, heating coils can be placed in the filter for that purpose.

The top, the shell and the water separator are made of No. 10 galvanized sheet metal, reinforced by 2 x 2 in. angles, the remainder of the filter being No. 18 galvanized Toncan metal. The overall dimensions of the filter, exclusive of the water separator section, are length, 8 ft.; width, 4 ft., and height, 5 ft. As the oil is pumped into the filter it can be located in a convenient place in the engine room, and it is not necessary to place it in the basement as is the case with the ordinary gravity oiling system.

The Newark Foundrymen's Association

At a meeting of the Newark Foundrymen's Association held at Newark, N. J., on the evening of October 4, the members enjoyed an interesting exhibition of moving pictures which was given by the Goldschmidt Thermit Company, 90 West street, New York, illustrating some rapid welding operations by the thermit process. The pictures were explained by W. R. Hulbert, sales manager of the Goldschmidt Thermit Company. A striking series of illustrations showed the simultaneous welding of two serious fractures in a locomotive frame. The breaks were in two parallel sections of the frame and they were welded in a period of two hours. The pictures gave the most important details of the work. Illustrations of the process of continuous joint welding were given and views were shown of important welding operations on heavy shafts, flywheels, etc. Mr. Hulbert conducted a number of interesting experiments to illustrate the thermit process. He welded a butt to a metal plate within a few minutes and illustrated the heat of thermit material by dropping a quantity of it into a glass receptacle filled with water. The thermit descended through the water and burned a hole through a disk of metal at the bottom of the receptacle. After the exhibition Dr. E. A. Beck, who is a metallurgical expert with the Goldschmidt Thermit Company, answered questions regarding the use of the process.

A dinner preceded the business meeting. The following were elected to membership in the association: The Debevoise-Anderson Company, Rogers, Brown & Co., Goldschmidt Thermit Company, all of New York, and Samuel L. Moore & Sons, Elizabethport, N. J.

The charter of the Lansing Wheelbarrow Company, Lansing, Mich., having expired September 21, the company has re-organized, changing its name to Lansing Company. It is doing this for the reason that its old name was not comprehensive

enough to embrace the entire line of goods it manufactures. It makes not only a complete line of wheelbarrows and warehouse trucks, but an extensive line of steel scrapers, concrete and mortar mixers, automobile turntables, cast iron, rubber and fibre wheels and casters, etc.

A New Internal Combustion Engine

A new type of four-cylinder, four-cycle, water-cooled gasoline motor designed by R. C. Mitchell has been built by the Webster & Perks Tool Company, Springfield, Ohio. A feature of the motor is the location provided for the magneto on a bracket attached to the end of the rear cylinder. Fig. 1 is a view of the engine taken from the rear or flywheel end, while Fig. 2 shows the engine from

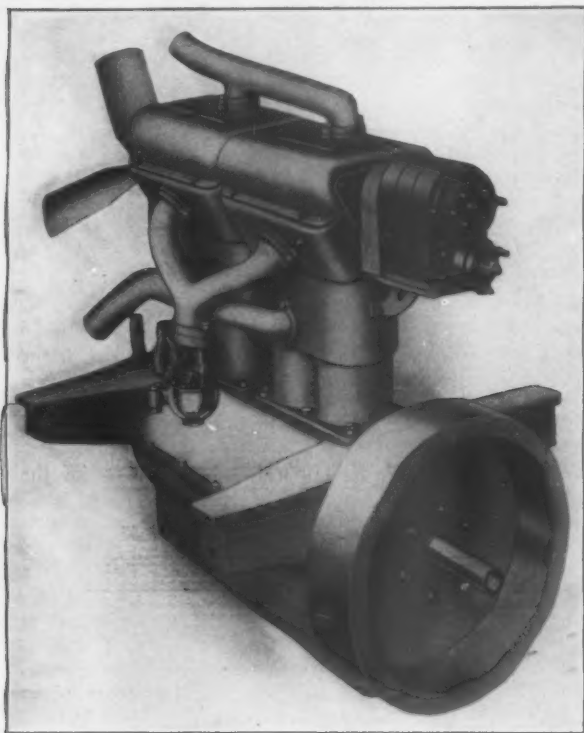


Fig. 1.—A New Four-Cylinder Four-Cycle Water-Cooled Gasoline Engine Designed by R. C. Mitchell, Springfield, Ohio.

the opposite end, while a portion of the casing has been broken away to show some of the interior mechanism.

The valves are located in cylinder heads, the inlet on one side and the exhaust valve on the other, both being inclined at an angle of 30 deg. to the center line. As is customary the valves are mounted in cages which facilitate the removal of the cage and the valve for regrounding and this removal is accomplished by loosening one screw. The valves seat against the cages instead of the cylinder casting and are actuated by four barrel cams each operating the valves for one cylinder. It is claimed for these cams that in addition to opening both valves they also

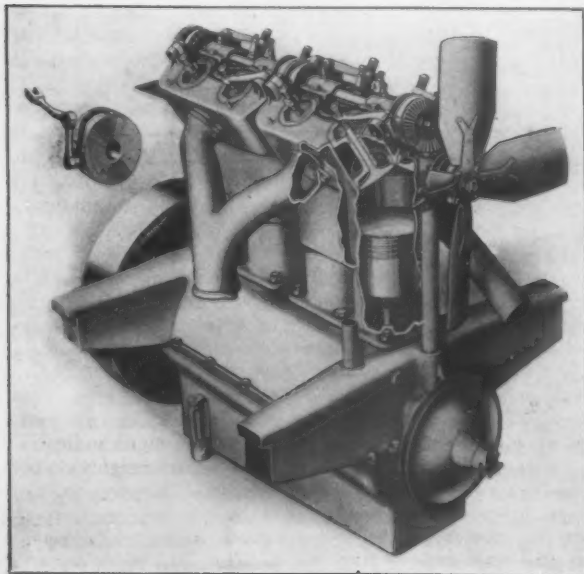


Fig. 2.—View of the Motor with the Casing Partly Broken Away to Show Details of Valve Mechanism.

close them positively, thus insuring a uniform charge in the cylinders at all speeds.

The camshaft is located on top of the cylinders and is driven by a vertical shaft which receives its power from the crankshaft by bevel gears. The construction of the cams and their location on this shaft, it is explained, insures the valves always being in time and does away with the heavy springs usually employed for closing the valves. Lubrication of the camshaft is accomplished by wick-oiling bearings with an ample reservoir. All moving parts of the engine, the camshaft and the cams are encased in dust-proof hoods which can be quickly and easily removed for inspection.

The novel location of the magneto is calculated to keep the magneto free from dirt and grease and as the generator extends through the dash, an adjustment can be made without leaving the seat and is readily accessible. A small spur gear at the end of the camshaft is employed to drive the magneto.

The lubricating system employs a pump located in the crank case, from which oil is delivered to a manifold or reservoir in the upper portion of this chamber. Small brass tubing conveys the lubricant from the reservoir to all of the bearings, thus insuring a constant flow of oil where it is needed. Before being placed on the market one of these motors with a cylinder of 4 3/16-in. bore and a 5-in. stroke was given a test in a seven-passenger touring car weighing approximately 3000 lb.

A New Mount Union Fire Brick Enterprise

The Mount Union Refractories Company, Mount Union, Pa., received a Pennsylvania charter September 12. The capital stock of the company is \$300,000, and the directors are as follows: R. P. M. Davis, president and general manager; F. D. Halstead, secretary and treasurer; C. V. Hackman, superintendent; Wilson Kistler and P. P. Griffin. Messrs. Davis and Hackman have been connected with the Harbison-Walker Refractories Company, Mr. Davis as works manager and Mr. Hackman as superintendent of the company's Mount Union plant. Mr. Halstead was formerly secretary, treasurer and general manager of the Queen's Run Fire Brick Company.

The new company owns large quantities of ganister rock near Mount Union and has begun the erection of a plant for the manufacture of silica and magnesite brick. The purity of the ganister rock is what has made Mount Union silica brick famous, and the new company has an immense supply of such material. The construction of the entire plant, including stock sheds, will be of brick and steel, with concrete foundations. Its capacity will be 80,000 brick per day.

Exporters Should Fully Describe Merchandise

The Bureau of Statistics, Department of Commerce and Labor, Washington, D. C., has issued a circular calling the attention of exporters to the importance of extreme care in properly and fully describing merchandise offered for exportation. This necessity is especially apparent in the case of merchandise forwarded from interior points to the exporting ports to be there "manifested" (or described for exportation) by the export agent, transportation company or steamship line to which it is consigned. Such merchandise is often so insufficiently described by the owners or consignors as to prevent its proper description by those presenting it for exportation. Persons forwarding merchandise for exportation should realize that all articles not fully and properly described are liable to encounter serious delay at the export port, as the customs authorities are required to insist upon a proper description, including quantity and value of the various articles, in the form of an export manifest, before a clearance shall be granted to the vessel on which the merchandise is to be exported. The circular quotes extracts from the laws and customs regulations, issued by the Treasury Department, indicating the manner in which merchandise for exportation must be described and manifested. Copies of the circular may be obtained by addressing Bureau of Statistics, Department of Commerce and Labor, Washington, D. C.

The Pittsburgh Steel Company's Report

The Pittsburgh Steel Company has issued its report for the year ended June 30, 1911. The income amount compares as follows:

	1911.	1910.	Changes.
Sales receipts.....	\$11,774,356	\$11,670,918	Inc. \$103,438
Expenses*.....	10,507,104	10,415,106	Inc. 91,998
Net earnings.....	\$1,267,252	\$1,255,812	Inc. \$11,440
Other income.....	5,924	28,782	Dec. 22,858
Total income.....	\$1,273,176	\$1,284,594	Dec. \$11,418
Charges.....	191,669	369,672	Dec. 178,003
Surplus.....	1,081,506	914,922	Inc. \$166,584
Dividends.....	741,899	479,520	Inc. 262,379
Surplus.....	\$339,608	\$435,402	Dec. \$95,794

*Materials used and cost of operations (including repairs and maintenance of plants), selling and general expenses.

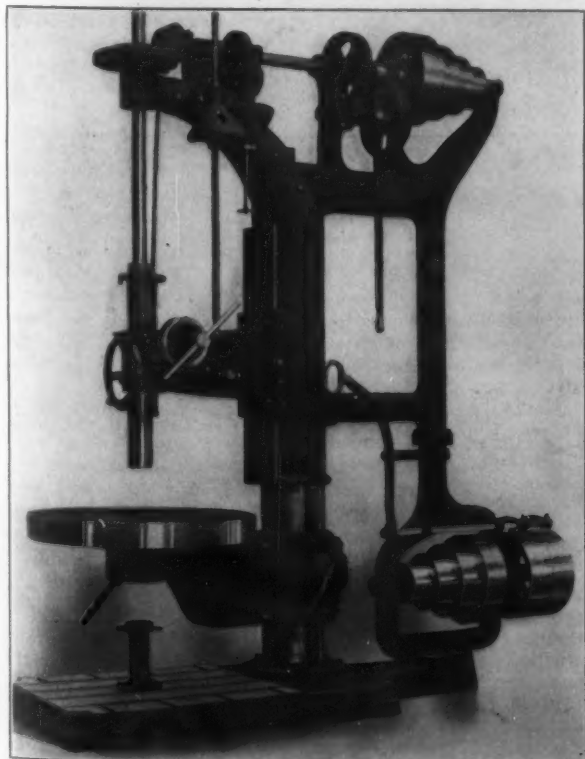
The general balance sheet as of June 30, 1911, compares with that of December 31, 1910, as follows:

Assets.		June 30, '11.	Dec. 31, '10.
*Real estate, plant and equipment.....		\$13,336,519	\$13,251,195
Stocks of subsidiary companies.....		330,000	330,000
Cash.....		905,938	886,576
Notes receivable.....		79,759	105,948
Accounts receivable.....		1,458,509	1,554,483
Loan and advances.....		864,168	843,706
Materials and supplies.....		2,123,579	2,485,526
Prepaid charges.....		6,913	41,097
Total.....		\$19,105,386	\$19,498,531
*Patent rights are not valued.			
Liabilities.		June 30, '11.	Dec. 31, '10.
Preferred stock.....		\$7,000,000	\$7,000,000
Common stock.....		6,000,000	6,000,000
Subscription receipts on common.....		484,270	294,460
Real estate, bonds and mortgages.....		30,000	30,000
Time and demand loans.....		950,000	1,511,197
Accounts payable.....		1,028,866	1,338,524
Dividends payable January 1.....		129,660	119,880
Profit and loss surplus.....		3,482,589	3,204,470
Total.....		\$19,105,386	\$19,498,531

All of the first and general mortgage bonds have since been retired.

New Snyder Heavy Duty Drills

J. E. Snyder & Son, Dewey and Parker streets, Worcester, Mass., have recently brought out a new heavy pattern 44 and 46 in. standard upright drill, the latter being the size illustrated. The main column, which is 11 in. in diameter, is strongly braced, weighs 1100 lb. and possesses sufficient strength to do the heaviest work the tool is called upon to handle. The base has a number of internal reinforcing ribs and is planed on both the top and bottom surfaces. The head has an ample bearing on the column and is exceptionally rigid. Crucible steel is em-



The 46-in. Heavy Duty Drill Press Built by J. E. Snyder & Son, Worcester, Mass.

ployed for the spindle which has a 2½-in. bearing in the sleeve and a 2¼-in. bearing in the large bevel gear at the top. The hole in the spindle is bored to conform to the No. 5 Morse standard taper and the spindle nose which is 4 in. in diameter is furnished with a ball bearing. The table supporting arm has a bearing on the main column 11 in. diameter and 15 in. deep, while the table is strongly braced underneath and has an ample bearing on the arm.

The drive is from the countershaft at the base to the overhead countershaft, four speed changes being rendered available by the use of a four-step cone pulley. The belt shifter is controlled by the pull handle, which projects to a point just above the lower column brace, and the back gears, which have a ratio of 7¼ to 1, are controlled by friction.

The following table gives the principal dimensions and specifications of the 46-in. drill:

Over-all height, in.....	118
Maximum distance spindle to base, in.....	59½
Maximum distance spindle to table, in.....	37½
Length of head on column, in.....	18
Length of table arm on column, in.....	15
Diameter of column, in.....	11
Diameter of driving pulleys, in.....	16
Face width of driving pulleys, in.....	5
Width of main driving belt, in.....	5
Number of cone pulley steps.....	4
Diameter of smallest cone pulley step, in.....	7½
Diameter of largest cone pulley step, in.....	16
Face width of cone pulley steps, in.....	4½
Width of cone pulley driving belt, in.....	4½
Diameter of table, in.....	37
Diameter of spindle in sleeve, in.....	2½
Diameter of spindle in bevel gear, in.....	2¼
Morse taper of spindle.....	No. 5
Diameter of spindle nose, in.....	4
Vertical feed of spindle, in.....	18
Diameter of crown gear, in.....	13
Diameter of bevel pinion, in.....	6
Length of base, in.....	84
Width of base, in.....	34½
Depth of base, in.....	3½
Width of face on column, in.....	10
Traverse of head on column, in.....	25½
Traverse of table arm on column, in.....	14
Ratio of bevel gears.....	2 1/6 to 1
Ratio of back gears.....	7¼ to 1
Speed of lower countershaft, r.p.m.....	235
Minimum spindle speed, back gears engaged, r.p.m.....	7
Maximum spindle speed, back gears engaged, r.p.m.....	31
Minimum spindle speed, back gears disengaged, r.p.m.....	50
Maximum spindle speed, back gears disengaged, r.p.m.....	230
Number of feed changes.....	5
Minimum feed per revolution of spindle, in.....	0.007
Maximum feed per revolution of spindle, in.....	0.052
Power required, hp.....	5
Floor space, in.....	34½ x 107
Domestic shipping weight, lb.....	6,400
Foreign shipping weight, lb.....	6,800
Contents of case, cu. ft.....	348

If desired, the drill can be supplied with a tapping attachment at a slight excess cost. All of the gears of this drill are provided with guards to protect the operator from possible chance of accident.

Vulcan High Grade Steel.—The Vulcan Crucible Steel Company, Aliquippa, Pa., has issued a brochure calling attention to the high character of its products. Both the crucible and open-hearth furnaces used by this company are operated with natural gas which, on account of its freedom from sulphur, is an ideal fuel for the melting of steel. The acid open-hearth steel which it makes does not contain more than 0.030 phosphorus and sulphur. The ingots are bloomed under a forging hammer and are rigidly inspected for any defects before finishing. The company manufactures chrome vanadium steel for all purposes requiring great strength and endurance, especially for automobile parts. Hecla vanadium steel is made for case hardening, for oil-hardened gears and for tools. The brand known as Wolfram high-speed steel contains a high percentage of vanadium and is carried in all sizes, annealed and unannealed. The brand known as Vulcan special vanadium steel contains a definite percentage of vanadium and is designed for all purposes where the finest grades of carbon steel are used, and is carried in all sizes, annealed. In addition to these classes of steel, the company manufactures tungsten magnet steels.

Some manufacturing plants, especially among the older works, lose themselves through a lack of signs indicating their whereabouts to the visitor. Industrial neighborhoods often prove a maze of streets and alleyways to the stranger, who welcomes the conspicuously lettered building and the well designated office. To him they are a saving of time and effort. It is worth while to use a building for its full advertising value, conveying to the world the name of the occupant and the product.

The Machinery Markets

An improvement is noticed in the machinery trade in several markets. There is an inquiry out in Chicago for bids on a small list of machine tools, and a list is expected from the Hyde Park High School. Trade is scattered in Cleveland, but the volume of buying is better. In Cincinnati business is not as good as it was this time last year, but a good number of inquiries are out for single tools, and the call for the smaller sizes of electric units is excellent. Inquiries have increased in Detroit, and an improved demand exists there for saw-mill equipment. Business that has been pending for some time has been closed out in St. Louis and the general tone of the market there is better. The Philadelphia trade is bidding on a fair-sized list of machine tools, and some good power business is coming forward. There are many signs of improving business in New England, where inquiries and orders are being placed in better volume. Drop forging manufacturers in the New England market are busy in supplying the automobile trade. New York dealers are expecting an additional list from the Delaware, Lackawanna & Western Railroad. Wood-working equipment is selling well on the Pacific coast, and electrical machinery is in good demand. In Texas good sales are being made of machinery for irrigation projects, and the Mexican market is opening up. The trade is busy again in the South, and new prospects are plentiful, the demand being principally for power-plant equipment, quarrying machinery, general contractors' equipment and refrigerating machinery.

New York

NEW YORK, October 11, 1911.

The Delaware, Lackawanna & Western Railroad, which has a list out calling for about \$8,000 worth of machinery, is preparing an additional list to cover shop needs at Scranton, East Buffalo, Elmira and perhaps the shops at Kingsland, N. J. From all accounts the company is planning to spend fully \$25,000 in the immediate future, most of which will be expended for metal-working equipment. This is the most important matter of machinery interest before New York dealers at present. Inquiries from other directions are good, but they come from widely scattered sources, and as a rule they cover only small lots of needed equipment. Machinery houses are still bidding on the requirements of the Frick Company, Waynesboro, Pa., which intends to spend \$25,000 or more. The Columbia Gray Iron Casting Company, Columbia, Pa., is also making inquiries in this market for foundry equipment and a small amount of machinery to replace that damaged by a recent fire at the company's plant. The export demand continues especially good.

A number of New York machinery houses have inquiries from the Harlan Hollingsworth Corporation, Wilmington, Del. This company, which builds vessels and railroad cars, has let contract for the construction of a machine shop, 100 x 150 ft. in size. It will be remembered that some time ago the same company sent out a machinery list which called for about \$40,000 worth of mechanical equipment. The list was cut down and only about one-third of the material asked for was purchased. It is probable that the company will buy the rest of the machinery listed for the machine shop now under construction.

The Otis Elevator Company, 17 Battery place, New York, has this week awarded a contract to the Thompson-Starrett Company, 49 Wall street, for an office and factory building to replace its works at Twenty-sixth street and Eleventh avenue. The building will be seven stories, 100 x 200 ft., and is designed to house the company's office, storage and repair shops. Pursuing this policy of centralizing its executive and mechanical departments the company also has plans by Burnham & Co. for an eight-story building to be erected at Jackson boulevard and Jefferson street, Chicago, Ill. These real estate operations will be in the hands of a company about to be organized which will be known as the Otis Realty Company.

Fire at the plant of the Robert Reiner Importing Company, Weehawken, N. J., October 2, damaged the building and a large amount of Swiss embroidery machinery stored there. The company is the American agent for Swiss embroidery machines and manufactures parts for the machinery. No plans for rebuilding have been prepared as yet.

The Luitwieler Pumping Engine Company, Rochester, N. Y., is in the market for a 10-ton crane, electric or steam, for its new plant now under construction.

The Commercial Motor Truck Construction Company, 828 Broad street, Newark, N. J., has been incorporated with \$125,000 capital stock to manufacture motor vehicles. The company is having experimental trucks constructed and intends to erect a factory 50 x 100 ft. The incorporators are William Dimond, John True and W. Eugene Turton, all of Newark.

The Hay Foundry & Iron Works, Newark, N. J., are in the market for a planer, electrically driven, with about a 7-ft. opening.

The Positive Clutch & Pulley Works, Buffalo, N. Y., now located at 24-32 Lansing street, has purchased five acres of land on the Niagara Falls division of the New York Central Railroad at Toisul street, in the new manufacturing district at North Buffalo, and is having plans prepared for a foundry building and extensive machine shops which it will build early next spring. The business of the company in the manufacture of pulleys, clutches, reversible glass and transmission machinery has grown very rapidly since the incorporation of the company, the forepart of the present year, and commencement of manufacturing operations necessitating the immediate enlargement of its facilities. S. A. Benedict is general manager and treasurer.

The Buffalo Forge Company has been awarded the contract by the Westinghouse Air Brake Company for the heating and ventilating system to be installed in the new shops which the latter company is erecting at Wilmerding, Pa.

The Flexume Sign Company, Buffalo, is building a one-story steel factory building at 1453 Niagara street.

The Grimm Mfg. Company, Buffalo, maker of combination sawing, planing, boring and mortising machines for carpenter contractors' use, is building a two-story concrete block addition to its factory at Keystone street and Walden avenue.

The factory of the Chadakoin Boat Company, at Celeron, N. Y., on Lake Chautauqua, near Jamestown, was destroyed by fire October 4. The loss on the building and contents was \$35,000. The factory is to be rebuilt at once.

The Mayfield Glove Company, Mayfield, N. Y., has been incorporated to manufacture gloves, mittens, etc., with a capital stock of \$100,000. The incorporators are S. W. Hallenbeck, E. D. Heacock and E. M. Brown, Gloversville, N. Y.

Joseph A. Morrow, Albion, N. Y., is having plans prepared for a large addition to be made to his machine shop on Orchard street. The new building will be 75 x 200 ft., three stories.

The Heater Muffler Company, Elmira, N. Y., has been incorporated to manufacture appliances for motors, engines, automobiles, etc., with a capital stock of \$50,000. W. Kinzie, L. D. Curran and A. G. Ingram, of Elmira, are the incorporators.

Revised plans are being prepared for the factory building which the Central Casket Company, 45 Niagara street, Buffalo, contemplates erecting at Manitoba street and the Erie Railroad, that city.

Plans have been prepared by J. N. Chester, engineer, for the installation of a 20,000,000-gal. pump at the water works station, Erie, Pa.

New England

BOSTON, MASS., October 10, 1911.

A good many signs of improving business conditions are in evidence. In the machine tool trade inquiries are much more numerous and some of the manufacturers report an increasing demand in the form of actual orders. With a few shops September was a really good month, and October opens as promisingly. For example one large builder of grinding machinery finds the works running so full that it would take little additional improvement to reach the full capacity mark. A greater number of orders, covering a larger variety of material, indicates a change for the better to the mill supply people. Some of the

THE MACHINERY MARKETS

machinery dealers feel somewhat encouraged by recent developments of their business, while others have experienced little improvement. The drop forging manufacturers are exceedingly busy, largely for the automobile trade. In Connecticut the hardware factories appear to be at least normally active. New Britain is making no complaint, and the large additions planned by the Russell & Erwin Mfg. Company and now completing for Landers, Frary & Clark bespeak a belief in the immediate future of their trade. In the Naugatuck Valley the manufacturers who cut up brass are doing a very good volume of business, but the brass mills are not running full, though the condition of their business could not be called dull. The general experience of traveling salesmen is more cheerful than it has been.

The New York, New Haven & Hartford Railroad will soon issue a small list of machine tools for the new roundhouse at New Haven. The Thomas Laughlin Company, Portland, Me., is completing a new building for which some machinery will be required.

Few manufacturers anticipate a boom in business until after the Presidential election, but they believe that conditions will improve somewhat, which would mean a good, average business and a profitable one. Many observers would prefer a continued fair market to the more short-lived boom, and would be well contented with an improvement of rather moderate scope.

The Norton Grinding Company, Worcester, Mass., is contemplating equipping a complete pattern shop in the new building now nearing completion. At the present time patterns are made by outside parties. No definite decision has been made in the matter.

The large works of the Holtzer-Cabot Company, Brookline, Mass., manufacturer of electric motors and other electrical equipment, were burned October 6, with a loss estimated at higher than \$200,000. The plant was practically wiped out. While no announcement has been made the trade presumes that the factory will be re-established as soon as possible, for the business is a well known and profitable one. A large amount of machinery will be required when the time to purchase equipment arrives.

Frank E. Seeley has been made vice-president and assistant treasurer of the Standard Mfg. Company, Bridgeport, Conn., manufacturer of gear cutting machines and other machine tools and specialties, and will devote himself to the sales end of the business. C. E. Bilton is the president and treasurer. Mr. Seeley has been the assistant general superintendent of the Bryant Electric Company for the past six years, and previous to that time was for six years with the New York Central Railroad as supervisor of shops at West Albany. He is a Yale man, taking his degree at Sheffield in 1899.

The business of the Waterbury Welding Works, Waterbury, Conn., has been incorporated with a Connecticut charter as the Waterbury Welding Company. E. S. Ross continues as the manager. The company does a large business in welding by the Davis-Bourneville oxy-acetylene process.

The Winter Bros. Company, Wrentham, Mass., manufacturer of taps and dies, contemplates increasing its equipment to some extent, though no additions to the factory are planned. The company states that its factory has been particularly busy for some weeks.

The F. & M. Brush Company, 14 Greendale avenue, Worcester, Mass., has begun the manufacture of a new wire brush for use in foundries and other manufacturing plants which require this class of equipment.

The Standard Mfg. Company, Bridgeport, Conn., has brought out a rack cutting machine which is an adaptation of the company's automatic gear cutter. The machine has a capacity to cut racks up to 8 in. wide and 2 1/2 in. in length, automatically feeding and indexing, and longer lengths with resetting of feed.

The Spencer Wire Company, Worcester, Mass., will erect two additional buildings immediately. One will be 60 x 120 ft., two stories, and will be used for general manufacturing purposes. A galvanizing building will be 24 x 80 ft., one story.

Additions to general manufacturing plants in New England include the following: Avery Chemical Company, 88 Broad street, Boston, plant at Lowell, Mass., 50 x 50 ft., three stories, with three wings, to cost \$150,000; Oliver M. Dean, Worcester, Mass., brooms, factory 48 x 72 ft., two stories; Alden Spear Company, Cambridge, Mass., two-story concrete factory; E. T. Wright & Co., Rockland, Mass., shoes, four-story

wing, 50 x 70 ft.; E. A. McMillin & Co., North Adams, Mass., two-story addition, 50 x 50 ft.; the Russell Company, South Farms, Conn., three-story building, 52 x 78 ft.

The published plans of the Gilbert & Barker Mfg. Company, Springfield, Mass., manufacturer of gas appliances, call for eight buildings. The main structure will be 63 x 105 ft., two stories; sheet metal building, 160 x 250 ft., one story; furnace building, 83 x 120 ft., one story; power house, 52 x 90 ft.; while there will be an office building, storehouses, testing house and minor structures.

Philadelphia

PHILADELPHIA, PA., October 10, 1911.

There is still a lack of anything definite in sight which the trade might consider particularly encouraging, at least as far as near future buying is concerned. But one list of any size—that of the Frick Company, Waynesboro, Pa., covering, it is said, some 15 tools, is before the trade that shows any indication of early closing. In fact, there is very little business under negotiation in this district beyond single tool propositions. Usually some minor shop equipment for small plants is being figured on, but recently there has been less business of that character offered. Transactions during the week have been comparatively unimportant; merchants report sales light, while manufacturers have been taking on but little new business, with orders of a diversified nature and coming from varied sections of the country. Special tool makers have taken a little better volume of business, but this varies according to the class of equipment built.

The general state of unrest as to future business conditions keeps buying of new equipment down to a minimum as well as retarding the development of new industries, which would become purchasers of machinery and tools, particularly those for metal-working purposes. Under the circumstances purchases are made only when new equipment is actually needed, and then the matter of immediate delivery is a factor. Railroad buying is practically at a standstill in this district. Little business is moving in second-hand machinery, purchases being varied and the demand irregular. Some fair business in power equipment is pending, but in this field developments are slow. Manufacturers of power transmission equipment doing an established business abroad report a slight improvement in that demand. The foundry trade is irregular, in the aggregate, however, the volume of business is slightly larger.

The Pennsylvania Equipment Company, West End Trust Building, is in the market for two and probably four second-hand standard-gauge locomotive cranes, of five tons' capacity. These must be in good order and subject to immediate shipment.

Estimates are being taken under revised plans for the proposed plant of the Lanston Monotype Company, to be erected at Twenty-fourth and Locust streets. The building is to be 176 x 268 ft., six stories, of concrete construction.

The Hub Machine, Welding & Contracting Company reports business in its line of Acme saw tables to have been comparatively good, extensive sales of both direct-connected electric and belt-driven machines having been made. In its welding department it has been quite actively engaged. A fair volume of business in general machine work is noted, although the plant is not being operated at its full capacity.

The Eynon-Evans Mfg. Company has recently completed extensive improvements to its brass foundry. This concern is quite busy in its pattern shop department and fairly busy in its machine shop. The general demand for brass and bronze castings has, however, not been very active.

The Iron City Foundry Company, Lebanon, Pa., is planning to build a new foundry plant on a plot of ground at Third and Willow streets, in that city, purchased by it some time ago. The main foundry building will be 40 x 1220 ft., and several other buildings are to be erected. While all the plans are completed the work of erecting the new plant will not be started until next spring.

The Chester Steel Castings Company, Chester, Pa., is enlarging and remodeling its chipping shop in order to obtain increased capacity and additional lighting facilities.

The Baldwin Locomotive Works is shipping by the steamship Livingstonia 20 locomotives to Victoria, Australia for the Victorian Government Railway. The de-

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THE MACHINERY MARKETS

mand for locomotives is usually confined to small lots. A recent order for five ten-wheel engines was received from the Norfolk & Southern Railroad. The Baldwin Works is taking preliminary estimates on the construction of an extensive addition to its erecting shop at Eddystone, for which it is said that in the neighborhood of 5000 tons of structural material will be required, although the prospects are that building will not be started in the near future.

E. T. & F. E. Mathewson, well known in the machine tool trade, have opened an office at 929 Real Estate Trust Building, and will engage in the general engineering business and the sale of special engineering equipment. They will be the direct representatives, in this territory, for the Toledo Bridge & Crane Company and Baker Brothers, both of Toledo, Ohio, the latter firm making high-speed drilling machines and cylinder boring machines; the Modern Tool Company, universal grinder and similar tools, and the Merrill Mfg. Company, pipe-cutting and threading machinery. Several contracts for the various lines of equipment represented by them have recently been closed.

Chicago

CHICAGO, ILL., October 10, 1911.

The past week has witnessed a material improvement in the inquiry for machine tools in this market and also in sales from the floor, in which most of the local dealers have participated. The very irregular course of business during the past several months has, however, destroyed confidence in the continuity of active business from week to week. Several of the inquiries mentioned in this report within the past fortnight are still unclosed. New inquiries include requests for prices on a 72-in. boring mill and a 36-in. lathe for the Chicago Water Works Department. A local manufacturer is in the market for tools aggregating in value about \$2,500. The list of specifications for the machine equipment to be placed in the new Hyde Park High School is expected in the near future and dealers are also interested in the prospects for extended equipments in connection with the proposed Nicholas Senn and Pullman schools. The Rumely-Wachs Machinery Company, which recently took over the assets of the McDowell, Stocker Company, has been rounding out its line of machine tools and now announces that it is handling the Becker Milling Machine Company millers, both vertical and horizontal; John B. Morris Machine Tool Company lathes and drills, Whitcomb-Blaisdell Machine Tool Company planers and the R. K. LeBlond heavy lathes.

The plant of the Home Stove Works, Chicago, was heavily damaged by fire last week. The loss was to the buildings and machinery.

The Midget Refrigerator Machine Company, Chicago, has been organized for manufacturing purposes by Morton L. Hamlet, John M. Spellman and John R. Lefevere, with a capital stock of \$100,000.

A new power and manufacturing building is to be erected in Chicago at the corner of St. Clair and East Erie streets by Frederick M. Bowes, of the Bowes Realty Company. The building is to cost \$150,000.

The Automatic Register Company, Chicago, has been incorporated with a capital stock of \$25,000 to manufacture and deal in recording machinery by Asa G. Adams, Dwight F. Bobb and James B. Westcott.

The Calumet Car Company, East Chicago, has been organized with a capital stock of \$75,000 to build railway cars. The following directors have been elected: A. A. McCalla, P. C. McCalla, D. W. Rogers, G. W. Lytton, W. L. Lytton, P. H. McCalla and A. H. Eroo.

The Ross Machine Company Lafayette, Ind., has been incorporated with a capital stock of \$15,000 to manufacture automobile parts.

The Hammond Steel Barrel Company, Hammond, Ind., has been organized with a capital stock of \$100,000. The following directors have been elected: J. H. LaFaye, N. A. Cunningham, C. F. Knowlton, F. H. Fox and W. A. Hill.

Smith & Holtern, Clinton, Wis., have arranged to move their plant to Janesville, Wis., where an additional building will be erected.

The Wisconsin & Michigan Railway, with offices at Marinette, Wis., is to rebuild its Peshtigo, Mich., car shops.

The Blake Specialty Company, Davenport, Iowa, has under construction a new plant, including a foundry building 30 x 100 ft. and a machine shop 75 x 80 ft.

The Wm. Galoway Company, Waterloo, Iowa, has just financed a bond issue, a part of the proceeds of which will be used for an addition to its plant.

The Elgin Canning Company, Elgin, Iowa, at a meeting of its stockholders decided to erect a new fire-proof factory building to cost not less than \$25,000.

A portion of the plant of the Hay Tool Mfg. Company, Council Bluffs, Iowa, was destroyed recently by fire, involving the loss of some machinery which will require replacing.

The Hawkeye Carriage & Auto Company has been formed at Cedar Rapids, Iowa, to engage in the manufacture of wagons and auto trucks, and a contract has been let for the erection of a one-story factory building.

The Waterloo Gasoline Engine Company, Waterloo, Iowa, is building an addition to its machine shop to be 120 x 400 ft. The extension of the factory is occasioned by the branching of this concern into the manufacture of light farm tractors and motor trucks.

The plant of the National Wood Works, Sioux City, Iowa, was recently damaged by fire to the extent of \$30,000. A rebuilding of the plant and the replacing of the damaged machinery is planned.

The Emporia Railway & Light Company, Emporia, Kan., is expending about \$35,000 for new machinery to enlarge its capacity.

The St. Joseph Plow Company, St. Joseph, Mo., has been reorganized coincident with the absorption of the Swanson Mfg. Company, under the name of the Swanson St. Joseph Plow Company, and has increased its capital stock to \$200,000.

Plans have been prepared by the Churchhill Automatic Electric Clock Company for the erection of a new factory at Pueblo, Col.

The Midland Valley Railway has let the contract for a four-stall round house to be erected at Wichita, Kan., by the Hammond Construction Company of that city.

The Chicago Scrap Iron Company, First National Bank Building, Chicago, expects to purchase shortly three or four large shears for shearing scrap iron, and may also install a traveling crane for the purpose of handling scrap in its new yards on the Belt Railroad, Chicago.

Cleveland

CLEVELAND, OHIO, October 10, 1911.

The local machine tool market shows quite an improvement. A fair volume of business in small orders, mostly for single tools, was placed during the week. Buying is scattered among manufacturers of various lines. A fair proportion of the business was in good-sized tools. While inquiries are not numerous they are better than they have been for some time. The demand for second-hand machinery is moderate. Machine tool builders still find business light, but orders with some are more plentiful than they were a few weeks ago. The demand for heavy handling machinery is not active.

Encouraging reports can now be made regarding the general manufacturing situation in metal-working lines in this city, which appeared to remain about stationary for several months. That a better volume of orders is coming in is indicated by an increase of the number of men employed, small additions to the working forces in a number of the shops having recently been made. Automobile plants continue to run about full and makers of automobile parts and accessories are generally busy.

Proposals for pumps for the high-pressure fire-service pumping station in Cleveland will be received by the Director of Public Service October 24. The specifications provide for four horizontal multi-stage centrifugal pumps, each of a capacity of 2500 gal. per minute, to pump against a pressure on the discharge end of the pumps of 270 lb. per sq. in. The pumps will be electrically driven. Bids will be received at the same time for four motors, to be direct connected. The specifications provide for three-phase, 60-cycle, 440-volt induction motors. The electrical equipment will include transformers, regulating devices, current breakers, switchboards, switches, etc.

Bids have been received for the new plant to be erected by the Ohio Wire & Steel Company, Warren, Ohio, plans for which have been prepared by Henry & Murphy, architects, Akron, Ohio. The main building will be 80 x 475 ft., one section 375 ft. long to be

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two stories. The building will be of brick and steel construction with steel window sash. There will be eight annealing furnaces, one baking furnace and complete equipment for drawing light and coarse wire.

The Thompson Electric Company, Cleveland, has been incorporated with a capital stock of \$10,000 to manufacture the Thompson automatic cut-out hanger for electric lamps, now made by the Thompson Hanger Works, 337 Superior avenue, N. W. The company has been organized by the election of Allison J. Thompson as president and treasurer, and Jay E. Thompson, secretary.

The plant of the Morton Engineering Company, now located in Fresno, Cal., will be established in Galion, Ohio, provided citizens subscribe to \$30,000 in stock. The matter is in the hands of the Commercial Club in that city. The company will make gas engines and tractors.

Sealed bids will be received by the Director of Public Service, Cleveland, October 16, for transformers for the municipal electric-light plant.

The Toledo Fiber Package Company, Toledo, Ohio, has secured a site for a large new plant, having purchased an acre of land in Auburndale.

The Electric Signal & Engineering Company, Alliance, Ohio, has been incorporated with a capital stock of \$20,000 by D. C. Schultz and others.

Cincinnati

CINCINNATI, OHIO, October 10, 1911.

The machine tool business is not as good as it was last year at this time, although the inquiry just now, especially for single tools, is particularly encouraging. A large number of local tool builders are attending the National Machine Tool Builders' Association in New York this week, and it is understood that the majority of them will stay over a few days to look after their steadily increasing export trade.

The smaller units of electrical power equipment are in excellent demand, and one local firm reports the sale of over 500 motors during the past few months, solely for operating moving picture outfits.

The local steamfitters' strike has not yet been settled, and is causing some delay in the installation of heating and other equipment in both manufacturing establishments and residences.

The Cincinnati branch of the National Metal Trades Association will hold a business meeting October 17 in the Ohio Mechanics' Institute's new building. The apprenticeship committee will make a report recommending the abolition of the uniform rate paid apprentices and of the written contract. In lieu thereof it will be suggested that each company shall issue to its apprentices a written statement specifying the wages to be paid, length of service, work to be done in the various departments, and that instead of a bonus of \$100 being paid the apprentice at the end of four years he shall receive each year a certificate for \$25, bearing interest at 4 per cent, which is payable at the end of his four year's service.

The Favorite Stove & Range Company, Piqua, Ohio, is just completing a manufacturing building that is said to be one of the best of its kind in the Central West. The new structure is of reinforced concrete construction, 140 x 300 ft., with concrete floor and monitor type roof. Not all of the necessary equipment has yet been purchased.

The Cincinnati Veneer Company is reconstructing its plant at 1285 West Sixth avenue, recently destroyed by fire. It is understood that some woodworking machinery and other equipment is yet to be purchased.

It is rumored that the G. J. Brethaur Planing Mill Company, Cincinnati, is having plans prepared for a large addition to its plant in the western section of the city.

Some power plant equipment will be required by the Ohio Agricultural Experiment Station, at Wooster, Ohio, to be installed in a proposed addition to its power house. Proposals for the building will be received until October 27 by Charles E. Thorn, director.

The Southern Engineering Company has been incorporated at Bluefields, W. Va., with \$10,000 capital stock, to handle mining and other machinery. J. E. B. Stewart, formerly sales agent at Bluefields for the Westinghouse Electric & Mfg. Company, is president of the new company.

The Hamilton Molding Sand Company, Hamilton, Ohio, has been incorporated with \$3,000 capital stock. William B. Mayo is one of the principal incorporators.

The Kenton Electric Lighting Company, Kenton, Ohio, is reported to have plans under way for a new electric lighting plant.

The Crystal Ice Company, Newport, Ky., has been incorporated with \$100,000 capital stock, and will probably soon commence work on a large ice plant. The incorporators are Joseph Adams, Ben. A. Adams and William Schmid.

The O. Armleder Company, Cincinnati, states that the current reports as to a proposed addition to its factory is incorrect, and that it has no intention of enlarging its facilities for manufacturing auto trucks just now.

The Kingery Mfg. Company, Cincinnati, has leased the factory buildings at 220-226 Pearl street, formerly occupied by the Incandescent Light & Stove Company, and will fit them up for the manufacture of ice cream freezers and other specialties.

The Taylor Heat & Light Company is a new incorporation at Columbia, Ohio, with \$30,000 capital stock. The new company's plans have not yet been given out. W. A. Chambers and C. S. Lehman are named among the incorporators.

The Dean Mfg. Company, Newport, Ky., jobbing founder and manufacturer of internal combustion engines, has increased its capital stock from \$100,000 to \$150,000. The only contemplated addition to its plant is an erecting room, for which no equipment will be required. The company is incorporated under the Ohio laws.

The Mercantile Company, Dayton, Ohio, manufacturing stationer, is having plans prepared for a four-story addition to its plant. Frank H. Smith, Dayton, is consulting engineer.

The Allyn Engineering Company, Lyric Building, Cincinnati, announces that the contract for the new large factory at Winston-Salem, N. C., for the Mengel Box Company, Louisville, Ky., has been let to Howard Morse, Newport News, Va.

Detroit

DETROIT, MICH., October 10, 1911.

While no changes of marked importance have appeared in the local machinery market, dealers generally report an increased number of inquiries and the demand for machine tools and general shop supplies is being well sustained. The demand for engines and boilers is light. Some sawmill equipment is being purchased in small lots and continued activity is expected in this line owing to the number of mills which have suffered fire losses recently. Michigan railroads are planning numerous improvements, work on which will be started before the new year, but so far very little buying has been done by the roads. There is a widely scattered demand for second-hand equipment in single pieces both of standard and special nature. Plants engaged in the metal trades are quite busy and the demand for both iron and steel castings is fairly good. Factory building operations are reported to be more quiet than those of last month but a considerable amount of miscellaneous work is under way.

The Lake Superior Iron & Chemical Company has set aside \$1,000,000 to be expended in improvements to its various plants and properties in northern Michigan. Of this amount \$300,000 will be spent in the enlargement of the plant at Newberry, Mich., the additions to which will include a retort plant 70 x 400 ft. for the conversion of wood into charcoal, a central power house and a large saw mill, the latter being already completed. The headquarters of the company are at 432 Penobscot Building, this city.

The Detroit United Railway, owner of the city's electric railroad system, has purchased a site of 15 acres in the western part of the city with the view, it is understood, of erecting extensive car houses and a branch power plant.

Edmunds & Jones, manufacturers of automobile lamps, are constructing a two-story brick addition to their present factory. In common with other automobile accessory plants, the company is finding it necessary to increase the capacity of its factory.

The Ross & Young Machine Company, conducting a general machine shop, is increasing its facilities by the erection of a new factory building on Center street.

The Superior Cigar Mfg. Company has awarded the contract for the erection of a large new factory building, which will allow the company to greatly increase its output.

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The National Iron Works has filed notice of an increase of capital stock from \$5,000 to \$25,000.

The Smith & Baldridge Machine Company has increased its capital stock from \$50,000 to \$90,000.

The Miller Car Company, which recently organized to engage in the manufacture of automobiles, has purchased a site in the northeastern part of the city with a view of erecting a factory in the near future. Theodore Miller is president of the company.

Two Detroit companies have announced plans for enlarging their branch plants in Windsor, Detroit's Canadian suburb. The E-M-F Automobile Company will erect a three-story addition to its present factory, giving it 40,000 sq. ft. additional floor space, and the Dominion Stamping Company has had plans prepared for an addition, two stories, 80 x 150 ft.

The Solvay Process Company, operating soda, ash and coke plants at Detroit and Solvay, N. Y., has increased its capital stock from \$8,000,000 to \$10,000,000.

The State Railroad Commission has approved the articles of incorporation of the Michigan & Indiana Traction Company, which has been organized with a capital stock of \$750,000 for the purpose of building an interurban railroad south from Battle Creek, Mich., to Indiana points. P. A. Hines of Chicago and H. P. Loveridge of Coldwater, Mich., are president and secretary, respectively, of the company.

Considerable improvements are to be made to the municipal electric light plant at Union City, Mich., including the purchase of a new generator and engine.

The Spring Valley Mining Company, which operates an iron mine near Iron River, Mich., has under construction an engine and boiler house 50 x 103 ft. and a dry house 24 x 100 ft. and will install a hoist engine, air compressor, generator and two 150-hp. boilers in the new buildings.

The Calumet & Hecla Mining Company will soon award its semi-annual contract for steel and machinery supplies and reports from Hancock, Mich. are to the effect that a number of steel manufacturing companies have sent representatives to Hancock as a result.

The Cogswell Motor Car Company, Grand Rapids, Mich., has filed articles of incorporation giving its capital stock at \$10,000. The company will manufacture both automobiles and auto parts.

Fire which destroyed the stove and hoop mill of the T. E. Jackson Company at Pellston, Mich., caused a loss of \$25,000. It is expected that the company will soon take steps to rebuild.

A receiver has been appointed to take over the affairs of the Van-L. Motor Car Company, Grand Rapids, Mich. The company was only recently organized and had done little in a manufacturing way.

Frank Burt, president of the Kalamazoo Mfg. Company, is organizing a company for the manufacture of suction street cleaners. The cleaner is an invention of Mr. Burt and will be constructed along entirely new lines.

The Standard Flaked Food Company of Owosso has accepted plans for the construction of a new factory and the building will be immediately erected. H. P. Davies is president of the company.

Jacob C. Fetter has purchased a half interest in the Burrage Shear Company, Sturgis, Mich. The company reports an excellent volume of business, including a considerable export trade.

The E-Z Suction Cleaner Company has been organized at Saginaw, Mich., with a capital stock of \$50,000 and will engage in the manufacture of vacuum cleaners.

The city of Baraga, Mich. will receive bids until October 16 for the construction of a waterworks system and electric light plant at an estimated cost of \$30,000. The Oscar Clausen Engineering Company is the engineer in charge.

Indianapolis

INDIANAPOLIS, IND., October 10, 1911.

The Hackedorn Construction Company, Indianapolis, has increased its capital stock from \$20,000 to \$50,000.

The Sanitary Mfg. Company, Indianapolis, has been incorporated with \$25,000 capital stock to manufacture sanitary devices. The directors are L. D. Shearer, Frederick Grumme and George Urschel.

The Eckart Carriage Company, Auburn, Ind., has increased its capital stock from \$100,000 to \$200,000.

The Hydro-Electric Light & Power Company has been incorporated at Connersville Ind., with a capital

stock of \$100,000 to furnish light and power. The directors are E. D. Johnson, L. R. Johnson and W. E. Lowe.

The Indiana Limestone Company, Bedford, Ind., has been incorporated with \$250,000 capital stock to quarry stone. The directors are Arthur Schwarzenbach, C. C. Ingalls and Alva Seyboldt.

The M. D. Moore Mfg. Company has been organized at Waveland, Ind., to manufacture can openers. The directors are M. D. Moore, J. W. Robertson and J. R. Sharp.

The Ft. Wayne Auto Motor Company, Ft. Wayne, Ind., has increased its capital stock from \$50,000 to \$100,000.

The Forse Mfg. Company, Pendleton, Ind., manufacturer of automobile parts, has increased its capital stock from \$25,000 to \$40,000.

The Malleable Steel Range Company, South Bend, Ind., has been sold by Harry A. Engeman, Jr., Joseph D. Oliver and Lewis C. Matthews to W. L. Kiser and Jacob Woolverton.

The Indiana & Michigan Electric Company, South Bend, Ind., is rebuilding its large power plant here at a cost of about \$500,000.

The Hoosier Refrigerator Company has elected the following officers: C. W. Reed, president; J. C. Taler, Galesburg, Ill., vice-president; Harry Ader, Peru, secretary, and W. S. Pond, Peru, treasurer.

The Rifle Mfg. Company has been organized at Valparaiso, Ind., and incorporated with a capital stock of \$100,000 to manufacture washing machinery. The directors are W. W. Rifle, Kempton Ellis and H. B. McCoy.

The Indiana Rolling Mill Company, New Castle, Ind., by action of its directors, has decided to rebuild its shovel plant destroyed by fire a few months ago.

The South

LOUISVILLE, KY., October 10, 1911.

The outlook, as the result of increasing business during the past week or ten days, is much more cheerful from the standpoint of local machinery manufacturers and dealers. A good deal of business is being closed, and plenty of prospects are in the market. A good many orders for power plant equipment are being received from going concerns, indicating that dealers and manufacturers are not being compelled to depend entirely upon new enterprises for their sales. Boilers, quarrying equipment, refrigerating machinery and contractors' outfits are leading items in the machinery market at present. There is also a good demand for woodworking machinery.

Local steel and iron men who attended the recent convention of carriage builders at Atlantic City, N. J., have returned with reports of optimistic feeling among the carriage interests. They are consuming more axles and other material now than ever before, and as many of the manufacturers have gone into automobile making and others have emphasized their popular-priced vehicles there has not only not been a loss as a result of the encroachment of motor cars, but an actual gain in business following it.

The Louisville Soap Company has been making some additions to its power plant, installing three boilers made by the Henry Vogt Machine Company, Louisville. E. D. Morton & Co., Louisville, installed three Williams improved safety feed-water regulators on these boilers.

The Louisville Railway Company is installing some additional coal bins at its power house and has purchased the necessary conveying machinery. D. X. Murphy & Bro. are the architects.

Attention is being given a project of Mayor Head, of Louisville, to build a power canal from a point on the Ohio River east of Louisville, to a point on the river below the city, which would give a fall of 27 ft. A member of the city engineering department has been detailed to look into the feasibility of the project, and the Engineers' and Architects' Club of Louisville is to discuss it.

The O. K. Laundry, Louisville, of which William Beha is manager, is in the market for a 100-hp. boiler.

J. J. Blocker, of the Owensboro, Ky., Steam Laundry, is installing a power plant of considerable dimensions for the purpose not only of operating his laundry but serving other interests as well.

The Roberts & Schaefer Company, Chicago, has been given the contract to design and build the new

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locomotive coal-handling plant of the Kentucky & Indiana Terminal Railroad Company, Louisville. It will have a capacity of 500 tons.

The Norman Woodworking Company, Louisville, has let a contract to the Berlin Machine Works, Beloit, Wis., for the full equipment of saws, planers, etc., which it will require.

By reason of the installation of a large amount of machinery in its Louisville factory, the Henry Vogt Machine Company has equipped a complete forging plant, has doubled the capacity of its ice can department and also doubled the capacity of its machinery erecting department. Business with the company is reported to be excellent.

The Kentucky Electric Company, Louisville, has applied for a franchise to manufacture and distribute steam for heating in the central district of the city, and the ordinance is now pending in the General Council. The company is now completing the construction of an addition to its power plant, but if it succeeds in getting the franchise it will erect another stack and install additional boilers. A large amount of wrought iron piping will also go underground in serving the prospective patrons of the plant. The company has let contracts to the Robins Belt Conveying Company, Cleveland, and the Orten-Steinbrenner Company, Chicago, for the conveyor and crusher, respectively, which are to be installed in the coal handling section of its plant.

The Martin's Fork Coal Company, Pineville, Ky., has been incorporated with \$40,000 capital stock by W. G. Cheif, Ben F. Unthunk and H. H. Fuson. This is one of the coal development projects in the south-eastern Kentucky district.

The Kentucky Traction & Terminal Company, Lexington, Ky., is to build for the Lexington Utilities Company, a subsidiary concern, an ice plant in connection with its own power house, for the construction of which contracts have been let. The ice factory will have a capacity of 150 tons.

It is reported that the plant of the Maysville, Ky., Foundry & Engineering Company, which has been idle for several months, will be purchased by a company which is being organized for the purpose of manufacturing steam and hot water heating plants. New York interests are to put up \$45,000 of the proposed \$75,000 capital stock, and Maysville business men will subscribe the remainder. Among those interested are George Longnecker, W. W. Ball, Horace Cochran and John M. Hunt.

The Planters' Warehouse Company, Maysville, Ky., will erect a rehandling tobacco warehouse. The equipment of the plant will consist of hydraulic presses and other machinery.

The Hillman Sand Company, Limestone, Ky., will install a rock crushing outfit with a capacity of 200 tons a day. The company was recently organized with \$10,000 capital stock. C. W. Hillman is president and general manager.

R. A. Babcock has purchased the machine shop of W. I. Garrett at Providence, Ky. The concern will be continued along the same lines as heretofore, manufacturing cars for use in coal mines and smoke stacks, and doing repair work. Mr. Babcock has been connected with the Providence Mining Company.

Orangeburg, Ky., near Maysville, is considering the erection of a small electric light plant. Arrangements may be made to secure connections with some other plant.

The Prestonsburg Electric Light Company, Prestonsburg, Ky., has filed amended articles of incorporation increasing its capital stock from \$6,000 to \$10,000.

McKenzie R. Todd, state inspector and examiner, has reported on the Kentucky State University at Lexington, recommending the construction of a plant to supply power, heat and light for the buildings. The recommendations will be submitted to the Legislature at its session in January. Henry S. Barker is president of the university.

P. P. Mitchell, Edmonton, Ky., is constructing a flour mill.

The new plant of the Vulcan Steam Shovel Company, Evansville, Ind., is to be completed by December 1, it is reported.

B. W. Chapman, Alamo, Tenn., will erect an electric lighting and power plant.

D. F. White, J. D. Stoltz and associates, Adams, Tenn., are organizing a company for the establishment of an electric light plant.

The foundry of the Harriman Mfg. Company, Harri-man, Tenn., was destroyed by fire with a loss of \$7,000. It is to be rebuilt immediately.

The Wheland Machine Works, Chattanooga, Tenn., and the Chattanooga Machinery Company, Chattanooga, Tenn., have been consolidated, effective November 1, under the name of the Wheland Company, which will have a capital stock of \$1,000,000, according to an official announcement. The company will be one of the most important manufacturers of saw-mill equipment in the world. The Wheland Machine Works has been in operation for 45 years, and the Chattanooga Machinery Company has been in existence for 25 years. Plans for improving the present plants are now under way. New equipment will be added and the arrangement of the plants thoroughly modernized. In addition to the line of standard machines which the company will market, it will make a feature of special woodworking equipment. The two new plants cover a total of 23 acres.

Arthur C. O'Connor, Detroit, is reported to be planning a plant in Memphis, Tenn., for the purpose of utilizing the wood ashes which are now the waste of saw-mills which use dust and scraps for fuel. It is intended to manufacture certain chemicals with the ashes.

It is reported from Chattanooga, Tenn., where the General Electric Company is opening branch sales offices, that the corporation has in view ultimately establishing a factory there for the manufacture of goods sold in Southern territory.

An abattoir is to be built at Vicksburg, Miss., according to plans which have been outlined by leading business men. Power and refrigerating equipment will be required.

The Gulfport & Mississippi Coast Traction Company, Gulfport, Miss., has announced that additional shops will be erected at Gulfport. The cost of the machinery will be \$5,000.

A contract has been let for the erection of the building of the Farmers' Cotton Oil & Fertilizer Company, Huntsville, Ala. Machinery is now being purchased.

Smith's Ideal Range Corporation, Lawrenceville, Va., has been incorporated with \$50,000 capital stock. B. W. Smith, LaCrosse, Va., is president, and H. C. Wesson, Lawrenceville, is vice-president. A plant for the manufacture of stoves will be erected at once.

John Martin, Robert McMillan and others have secured a waterworks franchise at Clarksville, Ga., and will probably build a plant.

The city of Jellico, Tenn., will receive bids until November 1, through Walter G. Kirkpatrick, engineer, Jackson, Miss., for furnishing machinery and materials and for the construction of a system of waterworks, comprising 12½ miles of mains with hydrants.

The Virginia Railway & Power Company, Richmond, Va., will erect a new power house with an initial capacity of 12,000 hp., but additional units will be installed later. Other improvements will be made.

Auburndale, Fla. will construct a plant for the manufacture of electric light and power. A system of waterworks will also be built.

Scottsboro, Ala. contemplates constructing a water plant. H. B. McCrary & Co., Atlanta, Ga., are the engineers in charge.

Jacksonville, Fla. is planning the expenditure of \$40,000 for the installation of a pump and making other improvements in its waterworks system. The municipality has also voted a bond issue for improving and enlarging the electric light plant.

St. Louis

St. Louis, Mo., October 7, 1911.

The month of October opened with some encouragement in the machine tool market as a result of the placing of some very fair orders during the past week on deals that have been pending for some time. No new business of especial moment has come out since the last report, but it is assured that some good inquiries are to come soon from sources not yet prepared to give out the specifications. Generally the dealers in the market see improvement in conditions, but expect the upturn in business to be gradual.

The Huttig Sash & Door Company, which was burned out some months ago and is now rebuilding, has out a list of some 20 wood-working machines for the equipment of the new plant. This deal is expected

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to be acted on during the coming week. At present the Huttig company is operating the Frye plant which it bought after the fire and filling orders for both concerns from that source.

The Sanitary Washing Machine Company has its new factory building about completed, and will be in the market very soon for several wood-working machines.

The Fulton Iron Works this week placed its order for a heavy 10-ft. reversing motor planer, which is the first tool ordered for the big new plant being built for the company in the western suburbs of the city.

The Mathews-Davis Boring Tool Company has its new plant well under way, and has made selection of most of its new tools, which are all special manufacturing machines. No standard tools of any consequence will be needed.

The Board of Public Improvements of St. Louis the past week let heating-equipment contracts aggregating \$18,221 for public buildings to the John B. Hughes Heating Company and to Edwin P. Ambler.

The Central Mill & Elevator Company, Bloomington, Ill., has increased its capital stock from \$17,000 to \$25,000 for the purpose of enlarging its equipment.

Webster Groves, an incorporated suburb of St. Louis, will vote October 28 on a bond issue of \$75,000 for the enlargement of the water-works system of the city.

The Racine Mining Company, Joplin, Mo., has been incorporated with \$18,000 capital stock by Clyde H. Scott, H. W. Dale and Frank W. Dale, and will install mining equipment on its property.

The Edwardsville Gas Company, which is to install a city gas plant at Edwardsville, Ill., across the Mississippi from St. Louis, has been incorporated with \$100,000 capital stock at Evansville, Ind., where the owners reside. They are P. J. Scheller, Henry Dannettell and H. I. Peckinpough.

The smelter at Nevada, Mo., operated by the late A. B. Cockerill, which has been closed about four years, is to be overhauled, new equipment added and operations resumed, capitalists of the Webb City, Mo., zinc district furnishing the money.

Work has been begun on the addition to the plant of the Dorris Motor Car Company. It consists of a building 200 x 200 ft., three stories, adjoining the original factory. It will be fireproof and will cost \$100,000 exclusive of the mechanical equipment, which will treble the capacity of the present plant.

The Busch-Sulzer Bros.-Diesel Engine Company, controlling the Diesel crude-oil motor patents for the United States, has optioned land for a plant in St. Louis. The company has a capital stock of \$2,100,000, and succeeds the American Diesel Engine Company. It is controlled by the Busch brewing interests. Construction of the plant will begin with the closing of the land deal. It will provide work for 600 employees when completed.

The Alvey Bros. Machinery Company, with \$12,000 capital stock, has been incorporated in St. Louis to do a general machinery business. The stockholders are John A. Alvey, Philip C. Alvey, William F. Alvey and Hugh H. Alvey.

The Wrought Iron Range Company, St. Louis, Mo., has had permits issued covering the building of its new plant comprising a two-story factory, 313 x 304 ft., cost \$163,000; a one-story blacksmith shop, 60 x 134 ft., cost \$10,000; a one-story boiler house, 43 x 68 ft., \$5,000, and other buildings.

The American Zinc, Lead & Smelting Company, Carthage, Mo., has plans prepared for the erection of a 500-ton mill near Carterville.

The American Aviation Company, Louis Mitchell, president, has contracted to locate a plant to build monoplanes at Little Rock, Ark.

Capt. J. G. Smyth is installing a pumping plant to irrigate 400 acres of land near Uvalde.

The Commissioners Court of Chambers County has ordered an election to be held October 21 to determine whether the proposed Trinity River irrigation district shall be organized. The district is to comprise 75,000 acres of land.

The recent election on the proposition of forming an irrigation district in Cameron county, to comprise 85,000 acres of land resulted favorably. The district has power to levy taxes and issue bonds for the purpose of constructing the canal and ditches. Bonds will be issued on the proposed improvement as soon as the surveys are finished. The Board of Directors of the district are A. T. Woodhouse, James La Gro, W. A. Boss, A. M. Deyo and J. C. Van Kirk of Brownsville.

S. E. Parsely and W. F. Payne have formed the Parsely-Payne Mfg. Company to manufacture a newly patented cotton chopping machine at Crockett. They have also purchased the wood-working and machine shops of H. A. Yeager.

Joe S. Lewis will install a large irrigating pumping plant near Gonzales to provide water for 500 acres of land.

The Commissioners Court of Cameron county has called an election for October 21 to vote on the proposition of organizing a drainage district in the San Benito section to embrace 100,000 acres. The estimated cost of the proposed drainage system is \$475,000, the surveys having already been made.

Applications have been made to the Commissioners Court of Brazoria county for the creation of a drainage district in the Blessings section to embrace about 50,000 acres of land. An election will be called to vote on the proposition of issuing bonds for making the proposed improvements. A. R. Leckie is the engineer in charge of the survey.

The City Commission of Dallas has let the contract to the Harris Air Pump Company to equip three wells in Oak Cliff with pumping machinery.

At Archer City a bond issue of \$12,000 has been authorized for the purpose of installing a waterworks system.

The City Council of Cleburne has under consideration the issuing of bonds to install a new waterworks plant.

The City Council of Artesia, N. M., has under consideration the construction of a sewer system.

The Alamogordo Improvement Company, Alamogordo, N. M., will construct a reservoir in La Luz canyon sufficient to irrigate 18,000 acres of land.

The Pecos Valley Water & Irrigation Company has been formed at Arno, with a capital stock of \$50,000. The incorporators are R. G. Werner, R. S. Johnson and F. E. Knaup.

The city of Austin has just finished a complete survey for a proposed extensive sewer system and the proposition of issuing bonds for the proposed improvement will be voted on at a date not yet fixed.

The Rio Grande Wax Company, with a capital stock of \$25,000, will install a large plant near Sanderson, for the manufacture of wax from the candelilla weed. The incorporators are J. G. Griner of San Antonio, Oscar Pacius of Sanderson and Dr. F. W. Reeve of Sanderson.

Clarke & Burge of Chicago, will install a modern electric light plant and waterworks system at Menard.

W. E. Schell & Co. will soon begin the installation of a complete system of waterworks at Port Lavaca. It will develop an artesian supply of water for the purpose.

New machinery, including a 200 k. w. direct-connected generator and a 300-hp. engine, will be installed in the municipal light and power station of Denton, at a cost of 10,000.

The city of Mexia will install a new engine and dynamo in its light and power plant.

The Port Lavaca Light & Power Company of Port Lavaca, will install a new 125-hp. engine and make other extensive improvements to its plant.

The Atlas Metal Works, Dallas, has sold its present plant and contemplates the erection of a new and larger factory.

The San Benito Cotton Gin Company, San Benito, has been incorporated by W. B. Alexander, T. J. Christa and Otto Ebeling, with \$30,000 and will install a ginning equipment at once.

The Roswell Light & Gas Company, Roswell, N. M., will enlarge its plant to 1500 hp. It will install

Texas

AUSTIN, TEXAS, October 7, 1911.

Improved conditions are noted in the machinery trade in Texas and the Southwest. Many good orders are being placed for various lines of machinery, particularly for irrigation projects and mines. There is also a stimulus in the demand for machinery for manufacturing plants. The situation in Mexico is improving now that the recent elections passed off quietly. It is believed that there will be a great demand for American-made machinery in that country during the next several months.

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two new 750-hp. producer gas engines, and the new plant will be so constructed that a second unit of similar size may be easily installed.

The Santa Gertrudes Mining Company, Pachuca, Mexico, will install two more tube mills at its property at San Guillermo.

The Veta Colorado Mining & Smelting Company, Minas Nuevas, state of Chihuahua, Mexico, will enlarge its mill at Minas Nuevas from 350 tons to about 600 tons daily capacity. Firman Smith of Knoxville, Tenn., is at the head of the company.

The Shattuck Mining Company of Bisbee, Ariz., will erect large reduction works at Douglas, Ariz.

The Globe Western Copper Company will erect a 100-ton mill at its mine near Miami, Ariz.

The Big Pine Mining Company will install a 100-ton cyanide plant at its mine 10 miles south of Prescott, Ariz.

Noah Allen, of Brownsville, is promoting the organization of an irrigation district near Cotulla, with the view of reclaiming about 60,000 acres of land. The work will involve the erection of a dam across the Nueces River and the construction of a large system of canals.

The Pacific Coast

SAN FRANCISCO, CAL., October 3, 1911.

The outcome of the municipal primary election is regarded with great satisfaction by commercial and industrial interests, and is considered a ground for some encouragement by local machine shop operators. Merchants and agents handling machine tools still report a rather quiet market, though a fair volume of business has been closed the past week. Few of the orders recently booked include more than two or three tools of ordinary stock design, and new inquiries coming up are of little importance.

Woodworking equipment has not been especially active of late, but small purchases are being made by a number of logging interests, in preparation for next season's work. Electrical machinery of all descriptions is in demand, and a few large orders have recently been placed. Plans which have been practically completed for extensions of electric traction lines in many parts of the state assure an active market in this department for the coming year. Aside from a fair demand for small hoists, pumps and air compressors, there is not much movement of mining machinery, and quarry equipment is also rather quiet.

Tools have been purchased for two new automobile factories. The California Motor Car Company of Oakland has ordered three lathes, two drills, a shaper, two grinders and a small portable crane. The Lewis Motor Truck Company, Gustave Brenner president and Chas. B. Lewis manager, has secured a location in San Francisco and made arrangements for its equipment, though the list of tools purchased is not made public. Several tools have also been purchased by the International Excavator Company, which is starting a factory for automatic excavators at Hayward, Cal.

A number of tools formerly used by the Risdon Iron Works are said to have been sold to the Government for use at the Mare Island Navy Yard. A new cupola has also been purchased for the Navy Yard.

The Pacific Coast Steel Company has completed its plant at South San Francisco, but has not yet started operations, owing to delay in the delivery of its first shipment of Chinese pig iron.

The United Properties Company, which controls some of the leading public service enterprises of Oakland, Cal., has placed orders for electrical equipment said to amount to about \$2,000,000, though nothing is given out as to the nature of the material ordered. It is known, however, that important extensions are to be built shortly to the San Francisco, Oakland & San Jose Railroad, an allied concern.

The city of Los Angeles, Cal., is preparing to install a number of cranes on the wharves in Los Angeles harbor.

A contract has been let for an electric light and power plant at Fort Miley, Cal.

The San Francisco Automatic Machinery Company has been incorporated in San Francisco, with a capital stock of \$100,000, by J. G. Rapp, G. L. Bender and T. J. O'Brien.

The California Pipe Line Machine Company has been incorporated in San Francisco, with a capital stock of \$20,000, by W. L. Norris, J. J. and P. H. Mahoney.

The Santa Ana Co-operative Sugar Company, Santa Ana, Cal., has placed a contract for beet sugar machinery, amounting to \$512,000, with the Dyer Company of Cleveland, O.

The town of San Mateo, Cal., has placed an order for a municipal pumping plant with the United Iron Works.

Figures have just been received for a municipal pumping plant for the town of Dorris, Cal. Figures were taken on both electric and gasoline pumps.

Sloan & Robson, engineers, San Francisco, will receive bids until October 18 for the construction of a municipal waterworks system for the town of Exeter, Cal., which will consist of a 100,000-gal. steel tank and tower, motor driven centrifugal pumps, water mains, etc. The cost is estimated at \$40,000.

A rock crushing plant is to be installed at the East Side Jail, Los Angeles.

The Illinois-Pacific Glass Company, San Francisco, has placed an order with the Geo. E. Dow Pumping Engine Company for a lot of air compressing equipment to be used in connection with glass blowing machines.

The Oliver Continuous Filter Company, San Francisco, has received orders from Mexican mining firms for two large filtering machines.

The California Glass Insulator Company has purchased a site near Long Beach, Cal., and expects to install a manufacturing plant shortly.

Bids have been called for on a lot of pumping machinery for the town of Whittier, Cal.

The Enterprise Foundry Company, San Francisco, has purchased a 20-acre tract at Richmond, Cal.

The Dempsey Concrete Machinery Company has been incorporated at Phoenix, Ariz., with a capital stock of \$50,000, by J. T. Dempsey, P. W. Carey and others.

The Coin Controlled Lock Company, organized to handle a lock invented by W. S. Farnsworth, Petaluma, Cal., is planning to install a factory in San Francisco.

It is reported that the Dry Creek Gold Mining Company will build a gold dredge near Cottonwood, Cal.

The Livermore Fire Brick Company, Livermore, Cal., is preparing to install a repress.

C. H. Mitchell, California representative of the Berlin Machine Works, has moved from the old Henshaw-Bulkley quarters to 155 Fremont street, where a full stock of Berlin woodworking machines will be carried.

The Great Western Power Company is setting up a rock crushing plant, including a No. 8 Gates crusher, at its Big Meadows dam site. The equipment was purchased about two years ago, but has never been used.

Ford & Malott are preparing to install a gravel cleaning plant near Niles, Cal.

The California Malleable Iron Company, recently organized to take over the plant of the Pacific Malleable Company at Riverside, Cal., is contemplating an extensive addition.

The Savage Tire Company is about to erect a factory for the manufacture of steel automobile tires at San Diego, Cal. This company was recently incorporated with a capital stock of \$1,000,000 and a tract of land was acquired on which a plant 145 x 600 ft. will be built.

The Berlin Machine Works, Beloit, Wis., has let contracts for the initial construction work for its new plant at Portland, Ore.

Western Canada

WINNIPEG, MAN., October 7, 1911.

The announcement was made recently that L. B. de Laitte, the French inventor, would proceed at once with the erection of a factory for the manufacture of so-called automatic gas in Vancouver. A plant to cost \$500,000 to manufacture the machinery required is proposed and it is estimated this will give employment to 300 workmen. It is claimed that by the automatic process gas can be produced nearly one-third cheaper than at present.

E. W. Davies, Calgary, Alberta, is considering the idea of starting a nail factory in Medicine Hat, Alberta.

Harry Twill and N. H. Martin, both of Medicine Hat, Alberta, are negotiating with that municipality

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with the object of establishing there a plant to manufacture gas-well drilling machinery, and heavy forgings.

The International Harvester Company of America is considering a proposal to erect a warehouse at North Battleford, Sask.

The Wallace Shipyards Company, North Vancouver, B. C., has taken out a permit for an extension to its machine shops.

The McLaughlin Carriage Company, Oshawa, Ont., is preparing to extend its garage at Winnipeg, Man.

The Crescent Creamery Company has plans under way for a new building in Winnipeg to cost \$280,000.

The Canadian Pacific Railway's Western shops are to be located at Calgary, Alberta.

Sealed tenders marked Tender for Power Station will be received by G. W. Robinson, secretary-treasurer of the city of Lethbridge, Alberta, up to and including November 24, 1911, for the supply, delivery and erection of equipment for the Power Station Extension, including boilers and accessories, mechanical draft and economizers, steam turbo-generator set and condensing equipment, steam engine driven exciter, sub-station equipment. Plans and specifications can be obtained from Arthur Reid, superintendent engineer, city of Lethbridge.

The Brandon Electric Light Company, Brandon, Man., plans the erection of a one-story addition, brick and steel, concrete foundation, steam heating, electric lighting, cement work, structural iron. Structural alterations are being made preparatory to the installation of large new dynamo. J. E. Mooring is superintendent.

The Alberta Sewer Pipe Company, Calgary, Alberta, has started manufacturing operations.

The Cram Lumber & Trading Company, Vancouver, B. C., is about to start another mill, Lapperton being the point selected.

It is the intention of the Power Committee of the Portage la Prairie, Manitoba, Council to waste no time in the erection to the addition to the municipal power plant which the city recently took over from the Central Electric & Gas Company. The work will be superintended by Alderman W. P. Ritchie, who erected the present plant.

The Saskatchewan River is being tested at Saskatoon as to its power possibilities in connection with the projected new dam. Mr. Richardson, of New York, consulting engineer, is supervising the test.

Cecil B. Smith, consulting engineer of the Winnipeg power construction department, has in hand plans for the erection of a \$250,000 power plant at Prince Albert, Saskatchewan.

The Life Saver Lock Company of Minneapolis has purchased a site in Winnipeg, and will establish a branch factory here.

The Hurst Engineering & Construction Company, Ltd., Winnipeg, has incorporated with a capital stock of \$20,000. Ralph B. Pratt, architect; Harold Edwards and D. A. Ross, civil engineer, all of Winnipeg, are among the incorporators.

A bylaw has been passed by the rate-payers of Davidson, Saskatchewan, to raise 10,000 for the purchase and installation of an electric light system. A. J. Robertson is secretary-treasurer of the town.

A bylaw will be submitted on October 16 in Dryden, western Ontario, to authorize the town to enter into an agreement with the Dryden Timber & Power Company to sell Dryden Park to the said company, to exempt it from taxation for ten years and to fix the rate of assessment at \$60,000 for that term, in return for which pulp and paper mills will be erected.

Eastern Canada

TORONTO, ONT., October 7, 1911.

The state of trade continues to reflect the very favorable underlying conditions. The wealth produced by the natural industries, the settlement of the tariff laws, the confidence of British investors and the general satisfaction of banking interests with the outlook are all on the side of continued healthy activity in trade and industry. There seems to be no cloud on the Canadian horizon. The bent toward speculation is being corrected by the influence of bankers and the chief dispensers of mercantile credit. Undoubtedly the speculative tendency was a source of danger, and, had the crops of the west not been unusually good,

there might have been serious trouble on account of the commitments of business men to ventures in fields outside of that to which their enterprise properly belonged. Competition is likely to be keener in the next twelve months than it was in the last. Every important contract for new equipment now brings tenders from manufacturers outside of the country. Contracts which a few years ago would not have been looked upon by American companies as worth troubling about are now drawing bids from the other side of the line. British houses, too, are increasing their interest and extending their business here. The work done by the British Trade Commissioner established at Montreal, with correspondents in the other important centers of the country, is proving fruitful in two ways. First, it is stirring up the interest of British exporters, and it is causing many of them to establish agencies here. Second, it is leading to the establishment of British branch factories. There has been a marked renewal of inquiries by American manufacturers who are considering the locating of branches in Canada. There is evidently an idea that the tariff will not be lord. Assuredly the steady importation of British capital is encouraging American manufacturers to plant branches here.

A contra-flow condenser manufactured by Richardson & Westgarth, Hartlepool, England, has been installed for the Nova Scotia Steel & Coal Company, North Sydney, N. S., by Peacock Bros., Montreal.

It is expected that in the January elections by-laws will be submitted to the ratepayers of Toronto for the construction of a tube railway system to cost about \$5,000,000 and for a viaduct to cost \$1,500,000.

The St. Catharines Broom & Brush Company, St. Catharines, Ont., is proposing to establish a factory in Calgary, Alberta.

A proposal to erect a plant for assembling automobile parts is before the Town Council of Lindsay, Ont. Parties representing the Ohio Automobile Company are said to be identified with the project.

The Automatic Wood Turning Company, St. Romuald, Que., is preparing to double its manufacturing capacity.

Canada Steel Foundries, Welland, Ont., is planning large additions to its plant.

The plant the John Deere Plow Company, Moline, Ill., proposes to erect in Welland, Ont., is to cost \$1,000,000.

J. Kiplin, local manager of the Imperial Oil Company of Canada, states that his company will immediately extend its refining plant at Sarnia to an extent involving the expenditure of at least \$500,000.

The MacIntyre Mining Company, Porcupine, Ont., will install a 40-stamp mill, spending altogether about \$250,000 on the plant.

At a meeting of the directors of the Porcupine Gold Mines, Porcupine, Ont., it was decided to erect a 100-ton mill south of the Hollinger.

The Porcupine Mohawk Company at Porcupine, Ont., one of the newer companies, is planning the installation of a shot drill on its property.

A. Wallberg, of the British-Canadian Power Company, started work that will eventually result in completion of the power plant at Wawatit Falls on the Mattagami River, northern Ontario, and the supplying of power to the Porcupine mines. Twenty-five men have commenced the building of camps that will later accommodate the force of 250 men who will build the big dam and install the machinery for a plant that will develop 10,000 hp. Supt. McNabb will, after the construction of the camps, build a canal 900 ft. long.

The A. E. White Machine Works, Eau Claire, Wis., which is erecting a branch factory at Windsor, Ont., will probably be in the market about January 1 for equipment for this plant, including a 14- or 16-in. x 8 ft. engine lathe, complete with quick change gear, hollow spindle, draw back bar and collets up to 7/8-in.; one drill press about 22-in., with power feed reverse motion and tapping attachment; one Yankee drill grinder to grind up to 1 1/4 in.; one double end emery grinder to carry 12-in. wheels; one buffing and polishing head to carry 12-in. wheels; one plain milling machine with table travel of 24-in.; one heating and tempering oven; one forge with a capacity to handle steel 3 1/2-in. to 4-in. diameter, and also some transmission equipment. This equipment may be new or second-hand but must be of improved patterns.

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Government Purchases

WASHINGTON, D. C., October 9, 1911.

The United States Engineer office, San Francisco, Cal., will open bids December 27 for the construction and equipment of two steel 20-in. pump dredges.

The United States Engineer office, Washington, will open bids October 23 for furnishing one 30-hp. 5-drum hoisting engine.

The office of the Supervising Architect, Treasury Department, Washington, will open bids October 25 for one gas engine and electric generator for the United States post office, London, Ky.

The Paymaster General, Navy Department, Washington, will open bids October 13, under schedule 3947, for two engine lathes, and on October 24, schedule 3946, one 21-in. turret lathe; schedule 3966, one die sinking machine, one anchor windlass with engine complete, one direct current motor, two hoisting and rotating equipment and five 3-hp. motors; schedule 3982, one double-back geared lathe, one pipe-threading machine, four ash-hoisting machines and two 50-kw. turbo-generating sets.

The Commissioners of the District of Columbia, Washington, opened bids September 28 for furnishing and installing one steam engine and one electric generator in the Armstrong Manual Training School, Washington, as follows:

Item 1, engine, Harrisburg Foundry & Machine Works, Harrisburg, Pa., \$1,394; National Electrical Supply Company, Washington, D. C., \$1,710; Thomas E. Bashor, Baltimore, Md., \$1,473; Buffalo Forge Company, Buffalo, N. Y., \$1,575; Carroll Electric Company, Washington, D. C., \$1,662; A. D. Granger & Co., New York, \$1,823 and \$1,750; Ames Iron Works, Baltimore, Md., \$1,147; Ball Engine Company, Philadelphia, Pa., \$1,358; Ridgway Dynamo & Engine Company, Ridgway, Pa., \$1,450; John D. Adt, Baltimore, Md., \$1,389; McCay Engineering Company, Baltimore, Md., \$1,420; American Engine Company, Bound Brook, N. J., \$1,709.

Item 2, one electric generator—McCay Engineering Company, Baltimore, Md., \$1,100; National Electrical Supply Company, Washington, D. C., \$1,035; Thomas E. Bashor, Baltimore, Md., \$893; General Electric Company, Baltimore, Md., \$997; Carroll Electric Company, Washington, D. C., \$1,028; Western Electric Company, New York, \$973.50; A. D. Granger & Co., New York, \$1,260; Burke Electric Company, Erie, Pa., \$1,045; Sprague Electric Works, New York, \$1,010; Ridgway Dynamo & Engine Company, Ridgway, Pa., \$1,100; John D. Adt, Baltimore, Md., \$1,244.

Item 3, engine and generator complete—Walker & Keppler, Philadelphia, Pa., \$2,616.50; Ridgway Dynamo & Engine Company, Ridgway, Pa., \$2,450; McCay Engineering Company, Baltimore, Md., \$2,470.

The Commissioners of the District of Columbia, Washington, opened bids October 2 for furnishing one 16-in. heavy back-geared motor-driven crank shaper, as follows:

Aumen Machine & Supply Company, Baltimore, Md., \$666.53; Fairbanks Company, Washington, D. C., \$620; Kemp Machinery Company, Baltimore, Md., \$729 and \$597, alternate; Manning, Maxwell & Moore, New York, \$690 and \$700, alternate; National Electrical Supply Company, Washington, \$650 and \$800, alternate; Queen City Machine & Tool Supply Company, Cincinnati, Ohio, \$635; Thomas Summerville Company, Washington, \$750.

Baltimore Industrial Notes

The Western Maryland Railroad has awarded the contract for the regrading and extension of its yard facilities at Port Covington to the Carter Construction Company, Cumberland, Md. Trackage facilities for 1000 additional cars will be provided. Plans for improvements in the vicinity of its Hillen Station in Baltimore have not been fully decided upon.

Local contractors have been estimating on the construction of a large warehouse to be erected in Hagerstown, Md., for the Fidelity Storage & Warehouse Company, Md., for the Fidelity Storage & Warehouse Company. The plans call for a four-story concrete structure, about 60 x 100 ft.

Baltimore contractors have been invited to bid on the construction of a 10-story fireproof hotel to be built in Macon, Ga., from plans by W. L. Stoddard, architect, New York. The building is to be of steel, with terra cotta and limestone trimmings.

The H. J. West Construction Company has been awarded a contract to erect a five-story warehouse at 211-213 West Pratt street for the trustees of the Johns Hopkins Hospital. The building is to be of reinforced concrete and fireproof throughout. The floors are to be concrete and steel. It is stated that the John Deere Plow Company will occupy the building when completed.

Municipal contracts in which the trade is interested have been slow in development. Changes in the municipal organization have interrupted departmental work to a considerable extent, and until the various

changes are completed the plans for various municipal projects under consideration will probably be delayed.

Dietrich Brothers are very busy on erection work in connection with contracts for the Baltimore Bargain House, which is now about three-fourths erected, and on the Maryland Casualty Company's new addition, the structural work for which is now beginning to go up. New business the past month has not been very heavy, but orders have been taken for a number of small jobs, including a new Odd Fellows' Hall in Westminster, Md. Some fairly good work is in sight.

The Chesapeake Iron Works reports a moderate increase in the demand for both structural and ornamental iron work, particularly of the small and medium size. A fair share of the demand is from local interests, although some good business has developed in the South. Orders recently taken include one for the structural work for the new building of the Atlantic Trust & Banking Company, Wilmington, N. C., requiring several hundred tons; a church building in Norfolk, Va., taking upward of 100 tons, and the structural work for the new plant of the American Ice Company, Baltimore. The estimating department is fully engaged, but the plant is still operating considerably under normal capacity.

The Municipal Factory Site Commission, A. S. Goldsborough, secretary, reports negotiations under way for a number of factory sites for new industries, of which at least four are considered as very promising, and one, that for the International Cable Railway Company, practically assured. As several of the propositions under consideration are of considerable size and importance, developments move slowly.

The Baltimore Bridge Company is very busy with work in hand, its capacity being pretty well covered for the next three or four months. A good share is for the export trade, although some little additional domestic work has recently been taken, including the general contract for the superstructure of pier 6 for the Baltimore & Ohio Railroad at its Staten Island terminus. In addition to the structural work, which will require about 300 tons of material, the sheet-metal work will also be furnished. An order for the steel work for a 100-ft. radius crane has also been received from the J. M. Dodge Company, which is to be erected at Shady Side, N. J. The Baltimore Bridge Company is making extensive shipments on export business, principally bridge work to Costa Rica.

Among the many large orders recently received by the railroad department of the General Electric Company, Schenectady, N. Y., are the following: Metropolitan West Side Electric Railway Company, Chicago, Ill., two 2000-kw., 600-volt rotaries, six 700-kw., 9000-430 transformers, two 20,000-cu. ft. blower sets and switchboard; Fairmont & Clarksburg Traction Company, Fairmont, W. Va., for Clarksburg, three 300-kw., 1200-600 rotary converters, nine 110-kva. transformers and switchboard; City & County Contract Company, New York City, for New York, Westchester & Boston Railway Company, one gasoline-electric equipment for construction car and control equipment; Lewiston, Augusta & Waterville Street Railway Company, Lewiston, Maine, one 300-kw. two-unit motor generator set and switchboard; Waldameer Construction Company, Erie, Pa., for Erie & Suburban Railway Company, one GE-205 four-motor car equipment; Pacific Electric Railway Company, Los Angeles, Cal., one motor generator set, one 17-kw., 500-125-volt exciter, three WC-50-450-15,000/13,500-2250-volt core type transformers; Delaware & Hudson Company, Albany, N. Y., one gas-electric motor car.

The Rateau Steam Regenerator Company, 140 Cedar street, New York, has been awarded a repeat order by the American Sheet & Tin Plate Company for a steam regenerator for its plant at Vandergrift, Pa. This regenerator will receive an intermittent flux of steam from reversing mill engines and will deliver a constant flux of steam to two mixed flow steam turbines of 500 kw. each. It has also been awarded a contract by the Atlanta Steel Company, Atlanta, Ga., for a steam regenerator, which will receive steam from reversing engines and also from a three-high mill engine. The steam is to be delivered by the regenerator to two mixed flow turbines of 500 kw. each. In both instances the mixed flow steam turbines are equipped with the Rateau patent mixed flow governor.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—		Genuine Iron Sheets—		METALS—	
Bar Iron from Store—		Galvanized		Tin—	
Refined iron:		Nos. 22 and 24.....		Straits pig.....	
1 to 1 1/2 in. round and square.....		No. 26.....		Lake ingot.....	
1 1/2 to 4 in. x 3/4 to 1 in.....		No. 28.....		Electrolytic.....	
1 1/2 to 4 in. x 1/2 to 5-1.....		Corrugated Roofing—		Casting.....	
Rods—% and 11-16 round and square.....		2 1/2 in. corrugated.....		Spelter—	
Angles:		No. 24.....		Western.....	
3 in. x 3-16 in. and larger.....		No. 26.....		Zinc—	
3 in. x 3-16 in. and 1/2 in.....		No. 28.....		No. 9, base, casks.....	
1 1/2 to 2 1/2 in. x 1/2 in.....		Tin Plates—		Lead—	
1 1/2 to 2 1/2 in. x 3-16 in. and thicker.....		American Charcoal Plates (per box)		Soldier—	
1 to 1 1/2 in. x 3-16 in.....		"A.A.A." charcoal:		No. 1.....	
1 to 1 1/2 in. x 1/2 in.....		IC, 14 x 20.....		Refined.....	
3/4 x 1/2 in.....		IX, 14 x 20.....		Antimony—	
3/4 in. x 1/2 in.....		A charcoal:		Bismuth—	
1/2 x 3-32 in.....		IC, 14 x 20.....		Per lb.....	
Tees:		IX, 14 x 20.....		Aluminum—	
1 in.....		American Coke Plates—Bessemer—		No. 1 aluminum (guaranteed over 99% pure).....	
1 1/2 in.....		IC, 14 x 20.....		Ingots for remelting.....	
1 1/2 to 2 1/2 x 1/2 in.....		IX, 14 x 20.....		Rods and Wire.....	
1 1/2 to 2 1/2 x 3-16 in.....		American Terne Plates—		Sheets.....	
3 in. and larger.....		IC, 20 x 28 with an 8 lb. coating.....		Old Metals—	
Channels, 3 in. and larger.....		IX, 20 x 28 with an 8 lb. coating.....		Dealers' Purchasing Prices Paid in New York.	
Burden's "H. B. & S." iron, base price.....		Seamless Brass Tubes—		Copper, heavy and crucible.....	
"Burden's Best" iron, base price.....		List November 13, 1908.....		Copper, heavy and wire.....	
Norway bars.....		Brass Tubes, Iron Pipe Sizes—		Copper, light and bottoms.....	
Merchant Steel from Store—		List November 13, 1908.....		Brass, heavy.....	
per lb.		Copper Tubes—		Brass, light.....	
Bessemer machinery.....		List November 13, 1908.....		Heavy machine composition.....	
Toe calk, tire and sleigh shoe.....		Brazed Brass Tubes—		Clean brass turnings.....	
Best cast steel, base price in small lots.....		List February 1, 1911.....		Composition turnings.....	
Sheets from Store—		High Brass Rods—		Lead, heavy.....	
Black		List February 1, 1911.....		Lead, tea.....	
One pass, C.R. R. G.		Roll and Sheet Brass—		Zinc, scrap.....	
soft steel. cleaned.		List February 1, 1911.....			
No. 16.....		Brass Wire—			
Nos. 18 to 20.....		List February 1, 1911.....			
Nos. 22 and 24.....		Copper Wire—			
No. 26.....		Base price, Carload lots mill 13%¢			
No. 28.....		Copper Sheets—			
Russia, Planished, &c.		Sheet copper hot rolled, 16 oz. (quantity lots).....			
Genuine Russia, according to assort-		Sheet copper cold rolled, 1¢ @ advance over hot rolled.....			
ment.....		Sheet copper polished 20 in. wide and under, 1¢ @ square foot.....			
Patent planished, W. Dewees.....		Sheet copper polished over 20 in. wide, 2¢ @ square foot.....			
Wood.....		Planished copper, 1¢ @ square foot more than polished.....			
Galvanized					
Nos. 12 and 14.....					
No. 24.....					
No. 26.....					
No. 28.....					
No 20 and lighter 36 inches wide, 25¢ higher.					

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